Arizona Department of Transportation

Intermodal Transportation Division
Roadway Engineering Group

MEMORANDUM

To: All Users of the Roadway Construction Standard Drawings	**Date:** 18 April 06
From: Mary Viparina MAV Assistant State Engineer Roadway Engineering Group	**Subject:** C-Standards Update

The October 2004 Roadway Construction Standard Drawings have been revised and updated, and are available for download on the Roadway Design web site at the following address: http://www.azdot.gov/highways/rdwyeng/roadwaydesign/viewable_drawings.asp

The attached spreadsheet summarizes the changes made to the previous drawings. The changes of note are more fully described below:

- C-02.20 & C-02.30: Revised cut and fill slope dimensions;
- C-05.30, Shts 3 & 4 of 7: Modified PLAN and PERSPECTIVE views to clarify ramp location;
- C-05.30, Sht 7 of 7: Added a PLAN and SECTION views for a brick detectable warning strip;
- C-10.76: Modified SECTION views to depict "F" shape; and
- C-11.10: Re-issued the drawings in four sheets. Sheet 4 shows the clamp designed to enhance the bicycle ridability of the cattle guard.

Design personnel should implement the updated drawings and incorporate them into their project plans. For projects at or near completion, where the inclusion of all new standard drawings is not practical, the 1A Sheet must accurately reflect the correct revision dates for the design. Construction personnel should review the drawing revisions for possible implementation on construction projects.

Please distribute this memorandum to all users within your Group, Section, or District, and arrange for printing of the updated Standard Drawings for those without computer access. Copies of the complete set of Roadway Construction Standard Drawings (either 8-1/2" x 11" or 11" x 17") may be obtained from Engineering Records located at 1655 West Jackson, Room 175, Phoenix, AZ 85007-3217 or by telephoning 602-712-8216.

The updated Construction Standards Index (1A Sheet) and Barrier Summary Sheets are also available on-line at the address shown above.

Please direct questions regarding this memorandum or the updated standards to Kenneth Cooper, Roadway Standards Engineer at 602-712-8674.

MAV/KRC/krc

c:
- Roadway Engineering Group
- Traffic Engineering Group
- Valley Project Management Group
- Environmental and Enhancement Group
- Districts (10)
- Statewide Project Management Group
- FHWA
- Contracts and Specifications Section
- Construction Group
- Bridge Group
- Regional Traffic Engineers (4)
- Materials Group
- Local Government Section
- Engineering Consultant Section
- District Permits Office (9)
- Engineering Records
- Maintenance Group
- Dan Lance
- Sam Maroufkhani
- Doug Forstie

STANDARD DRAWING	REVISION DESCRIPTION
C-02.10	Added "Rural" to title
C-02.20	Modified slope criteria – slopes and range. Modified drawing title.
C-02.30	Modified drawing title, slopes, and ranges. Added a note regarding proper standard application.
C-04.10, Sheet 2 of 2	Revised SECTION B-B and POST SLEEVE DETAIL by subduing graphics for post and w-beam guardrail. Revised note at outlet in SECTION B-B to correct references. General Note 4 revised by replacing "in lieu" with "instead."
C-05.12, Sheet 2 of 3	Removed Type 'G' Curb & Gutter from note.
C-05.30, Sheet 1 of 7	Modified General Note 2. Defined elevation of "Top of Ramp Curb" in SECTION B--B. Revised text orientation.
C-05.30, Sheet 2 of 7	Modified General Note 2. Revised text orientation in SECTION A--A.
C-05.30, Sheet 3 of 7	Modified General Note 3. Modified ramp location in PLAN and PERSPECTIVE views. Revised text orientation in SECTION A--A.
C-05.30, Sheet 4 of 7	Modified ramp location in PLAN and PERSPECTIVE views.
C-05.30, Sheet 5 of 7	Modified General Note 3.
C-05.30, Sheet 7 of 7	Added PLAN and SECTION views of brick option Detectable Warning Strip (DWS). Modified PLAN view of non-brick DWS. Added General Note 1. Re-labeled section and detail views.
C-05.50	Revised General Note 6. Rearranged drawings on sheet. Modified SECTION A--A. Revised Std Dwg reference in SECTION C--C. Re-labeled "PLAN VIEW OF SECTION C--C".
C-07.02	Revised General Notes 3 & 4 to correct Std Dwg reference from C-07.05 to C-07.04. Revised drawing titles.
C-10.51	Changed "PLAN VIEW" to "PLAN". Removed slope designation from sidewalk in SECTION views. Changed length of vertical taper from 12½" to 1'-0". Revised text orientation. Added "WITHOUT GUARDRAIL" to title of ELEVATION view of departure vertical taper.
C-10.52	Removed "D" reference and substituted "may" for "can" in General Note 5.
C-10.75, Sheet 1 of 2	Changed "PLAN VIEW" to "PLAN". Removed slope designation from sidewalk in SECTION views. Revised curb-height designation in SECTION A-A from "H" to "h".
C-10.75, Sheet 2 of 2	Changed "PLAN VIEW" to "PLAN". Removed dimensions at right side of PLAN view. Revised text orientation.
C-10.76	Changed "PLAN VIEW" to "PLAN". Revised SECTION view graphics to depict Type 'F' barrier.
C-10.77	Modified PLAN view to correct style and proportion of concrete half barrier and transitions. Modified references to other Std Dwgs.
C-11.10 Sheets 1 through 4 of 4	Re-issued Standard Drawing.
C-15.20, Sheet 1 of 3	Revised sheet number references.
C-15.91 & C-15.92, Sheet 2 of 2	Modified welding notations for ANSI conformance.
C-18.10, Sheet 2 of 3	Modified SECTION views to improve clarity.

From: Terry Otterness
Sent: Tuesday, April 25, 2006 11:13 AM
To: Chris Cooper; Urso Penalosa; Said Asad; Tim Wilson; Paul O'Brien; Joseph Warren; Baljeet Chawla; Vincent Li; Steve Mishler; Alfredo Zapata; Ken Brown; Robert Fortune; Kenneth Cooper; Jeff Beimer; LeRoy Brady; Susan Tellez; Robert Miller; Larry Maucher; George Wallace; Jim Delton; John Lawson; Steve Jimenez; John Carr; John Dickson; Greg H. Gentsch; Roger Hopt; George Chin; Chuck Gillick; Reza Karimvand; Daniel MacDonald; John Melanson; Lev Derzhavets; Oliver Antony; Pat Mahoney; Rod Collins; William Lyons; Bill Harmon; Dallas Hammit; David Sikes; John Harper; John Hauskins; Michael Kondelis; Paul Patane; Perry Powell; Richard Powers; Ron Casper
Cc: Mary Viparina; Sam Maroufkhani; Dan Lance; Doug Forstie; Sam Elters
Subject: Construction Std. Drawings- Slope Design Standard Revisions- C-02.20 & C-02.30

Please forward this e-mail notification to all roadway design personnel utilizing the subject Standard Drawings.

Please refer to the updated Construction Standard Drawings (Rev.date 4/06) that were issued today under separate e-mail notification. The maximum fill slope rates for Std. C-02.20 Rural Undivided and Fringe-Urban Highways and Std. C-02.30 Miscellaneous Roadways have been revised from 1 1/2:1 to 2:1. Also, the maximum cut slope rates for these two standards have been revised from 1:1 to 2:1. No slope changes have been made to Std. C-02.10 Rural Divided Highways. These revisions have been coordinated with the Materials Group Geotechnical Design.

The revisions to the slopes reflect what has been the norm for most projects. The 2:1 fill slopes provide a more stable embankment and provide an improved slope rate to establish vegetation and erosion control. The flatter 2:1 cut slope rates will also provide the same advantages. When in rock cuts, Geotechnical Design will continue to provide the maximum slope that can be used by the designer. Also, when cuts are in the higher ranges and there may be a significant project cost involved, Geotechnical Design will provide the designer the maximum slope that can be used to reduce the excavation required. The design process for establishing slope design for a project has not changed. The standard slopes simply provide the initial design slopes and the designer is to adjust the slopes for the project needs considering safety, material type, project costs, slope stablilization and other needs.

Thank you for your attention to these revisions. Please forward this e-mail to all users within your Groups and Districts. Contact your Roadway Group representative for any questions regarding these revisions.

Terry H. Otterness, P.E.
Staff Engineer
Roadway Design Section
PH 602-712-4285
FAX 602-712-3075
totterness@azdot.gov

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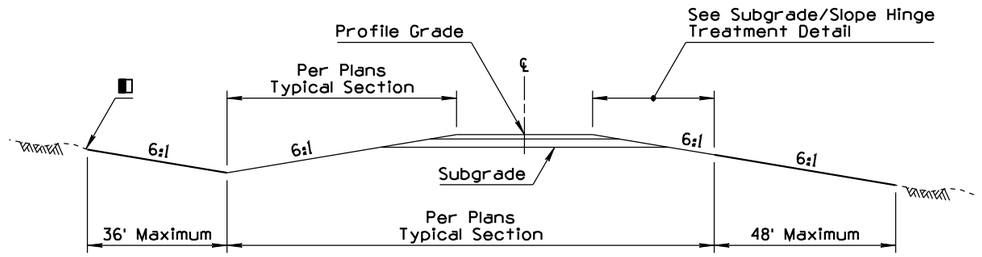
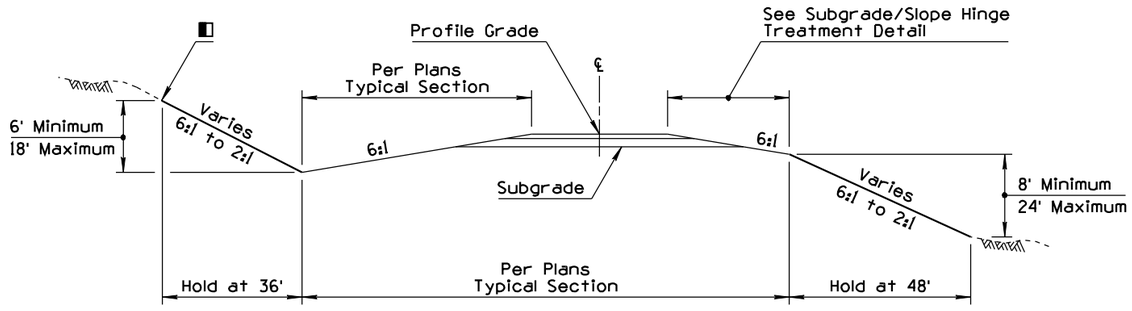
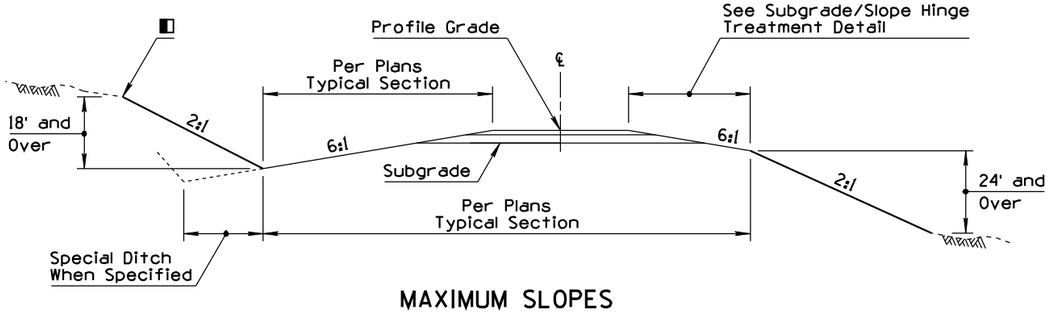
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	MODIFIED TITLE	RLF	4/06
2			
3			
4			



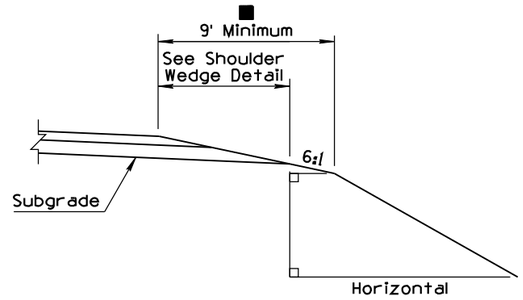
MINIMUM SLOPES



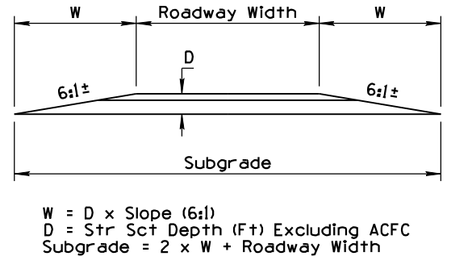
INTERMEDIATE SLOPES



MAXIMUM SLOPES

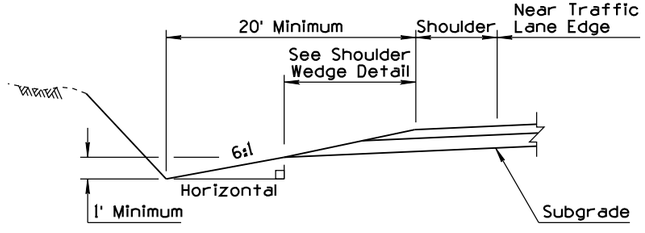


SUBGRADE/SLOPE HINGE TREATMENT DETAIL



W = D x Slope (6:1)
D = Str Sct Depth (Ft) Excluding ACFC
Subgrade = 2 x W + Roadway Width

SHOULDER WEDGE DETAIL



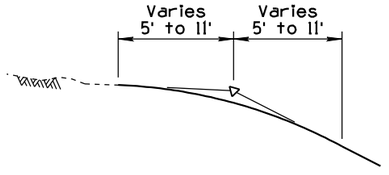
MINIMUM DITCH CONDITIONS DETAIL

GENERAL NOTES

1. Roadway width, cut ditch width, cross slope, and pavement structure section will be shown on project plans.
2. Pavement structure slope is nominal. Actual slope is controlled by (D). See Shoulder Wedge Detail.
3. Slopes beyond the pavement structure, such as embankment and cut slopes, are relative to horizontal.
4. For slope controls within interchange areas, see project plans.
5. When median slopes intersect, see project plans for controls.
6. These slopes are intended to be used with new or reconstructed roadways.

NOTE TO DESIGNERS

■ The 9' minimum is required when guardrail is utilized on the project. Treatment shall be uniform throughout the project length. The 9' requirement may be waived under special conditions where guardrail is not utilized.



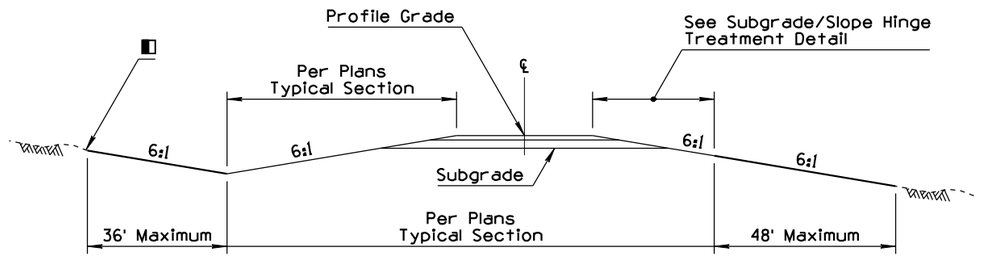
SLOPE ROUNDING DETAIL

◧ Except in solid rock, or as directed by the Engineer, the intersection of roadway cut slopes with the ground surfaces shall be rounded.

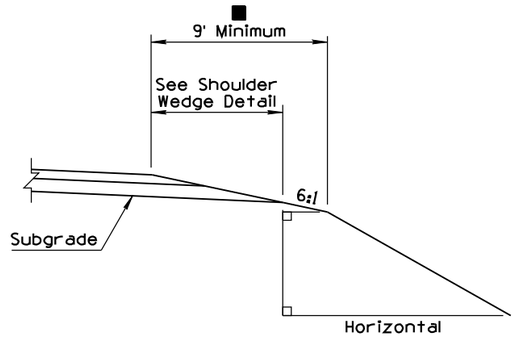
For cuts up to 6', use 5' semi-tangents for slope rounding. For each additional foot of cut add 1' to semi-tangent to 11' maximum.

APPROVED FOR DESIGN	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS	REV. 4/06
APPROVED FOR DISTRIBUTION	SLOPES RURAL DIVIDED HIGHWAYS (1)	DRAWING NO. C-02.10

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED TITLE	RLF	4/06
2	MODIFIED SLOPE CRITERIA	RLF	4/06
3			
4			



MINIMUM SLOPES



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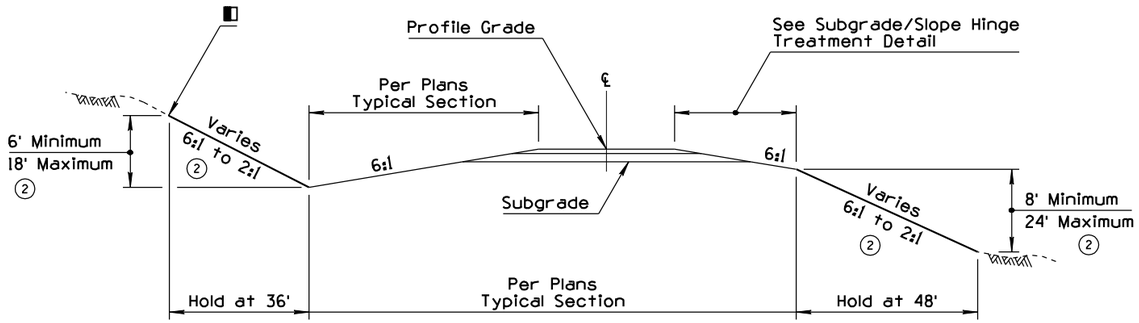
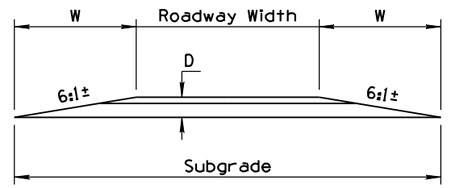


INTERMEDIATE SLOPES

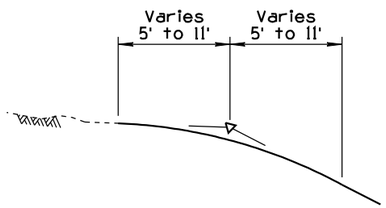


W = D x Slope (6:1)
D = Str Sct Depth (Ft) Excluding ACFC
Subgrade = 2 x W + Roadway Width

SHOULDER WEDGE DETAIL

NOTE TO DESIGNERS

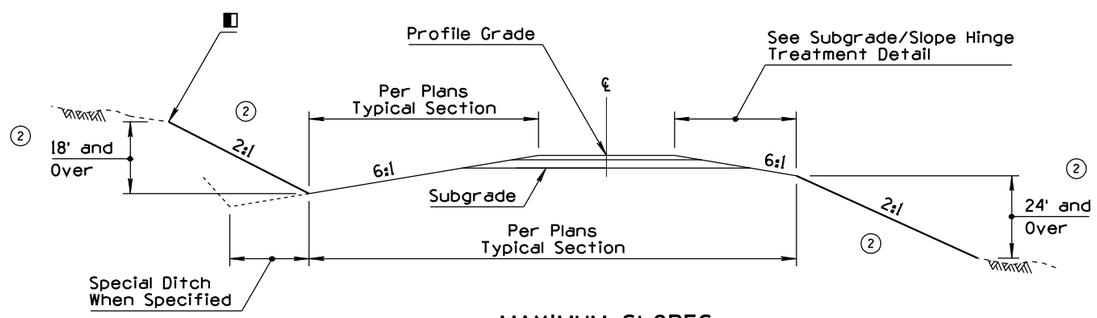
■ The 9' minimum is required when guardrail is utilized on the project. Treatment shall be uniform throughout the project length. The 9' requirement may be waived under special conditions where guardrail is not utilized.



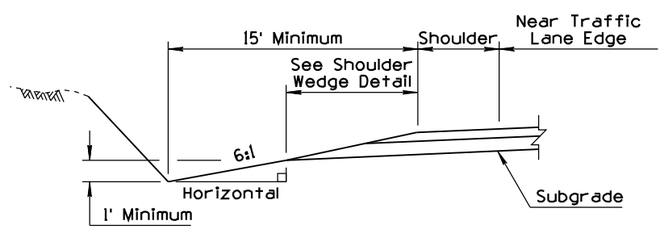
SLOPE ROUNDING DETAIL

◧ Except in solid rock, or as directed by the Engineer, the intersection of roadway cut slopes with the ground surfaces shall be rounded.

For cuts up to 6', use 5' semi-tangents for slope rounding. For each additional foot of cut add 1' to semi-tangent to 11' maximum.



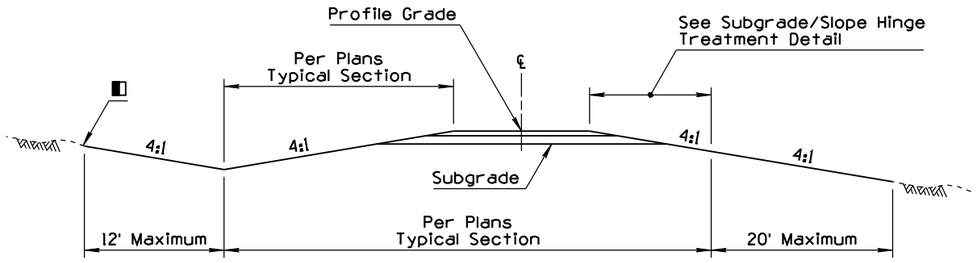
MAXIMUM SLOPES



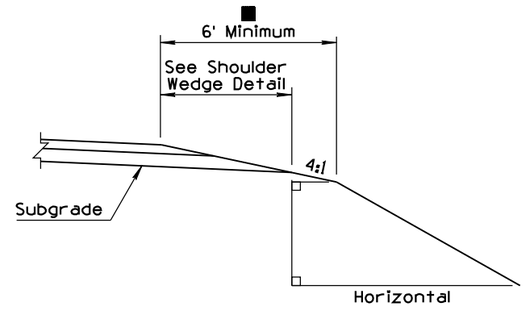
MINIMUM DITCH CONDITIONS DETAIL

APPROVED FOR DESIGN	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS	REV.
Mary Viparina		4/06
APPROVED FOR DISTRIBUTION	SLOPES (1) RURAL UNDIVIDED AND FRINGE-URBAN HIGHWAYS	DRAWING NO.
		C-02.20

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	MODIFIED TITLE	RLF	4/06
2	MODIFIED SLOPE CRITERIA	RLF	4/06
3	ADDED USAGE NOTE	RLF	4/06
4			



MINIMUM SLOPES



SUBGRADE/SLOPE HINGE TREATMENT DETAIL

GENERAL NOTES

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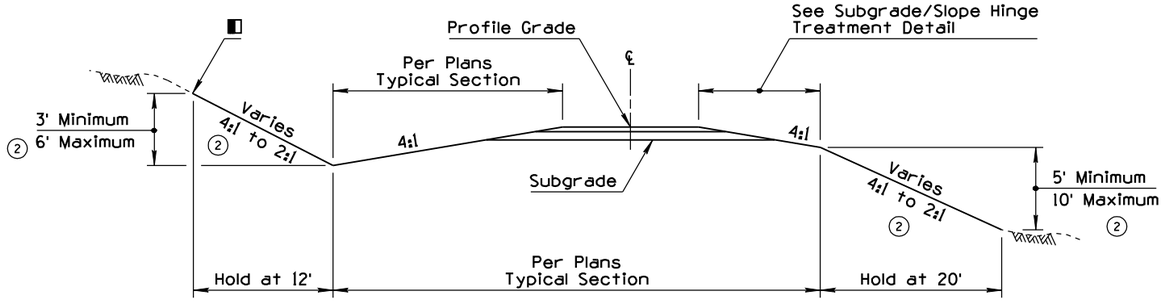
2. Pavement structure slope is nominal. Actual slope is controlled by (D). See Shoulder Wedge Detail.
3. Slopes beyond the pavement structure, such as embankment and cut slopes, are relative to horizontal.

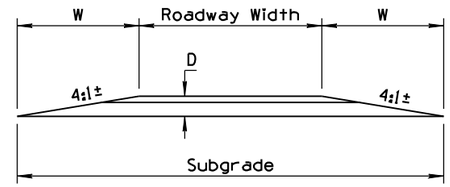
NOTE TO DESIGNERS

(3) USE OF THIS STANDARD IS LIMITED. SEE ROADWAY DESIGN GUIDELINES, SECTION 306.2.

■ The 6' minimum is required when guardrail is utilized on the project. Treatment shall be uniform throughout the project length. The 6' requirement may be waived under special conditions where guardrail is not utilized.



INTERMEDIATE SLOPES



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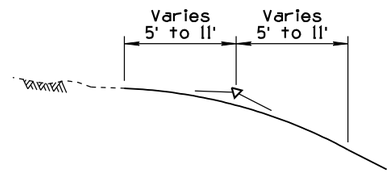
SHOULDER WEDGE DETAIL



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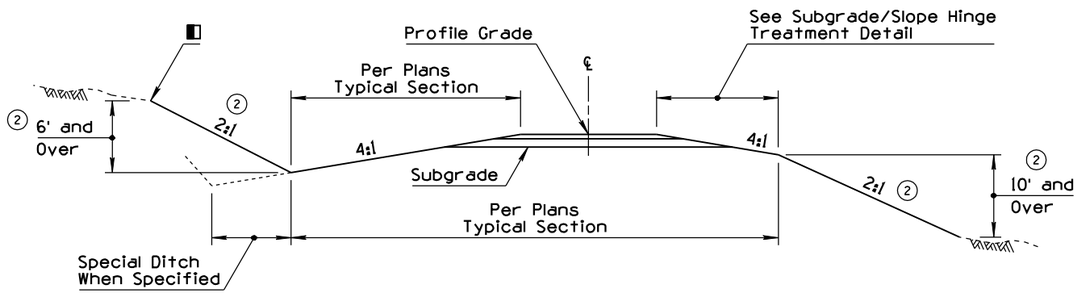

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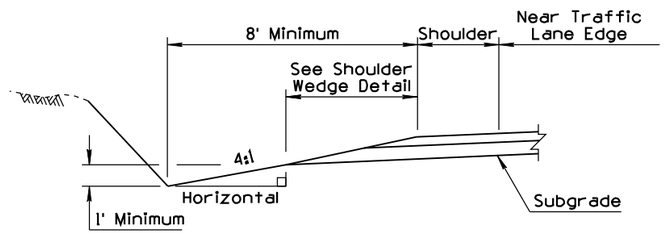
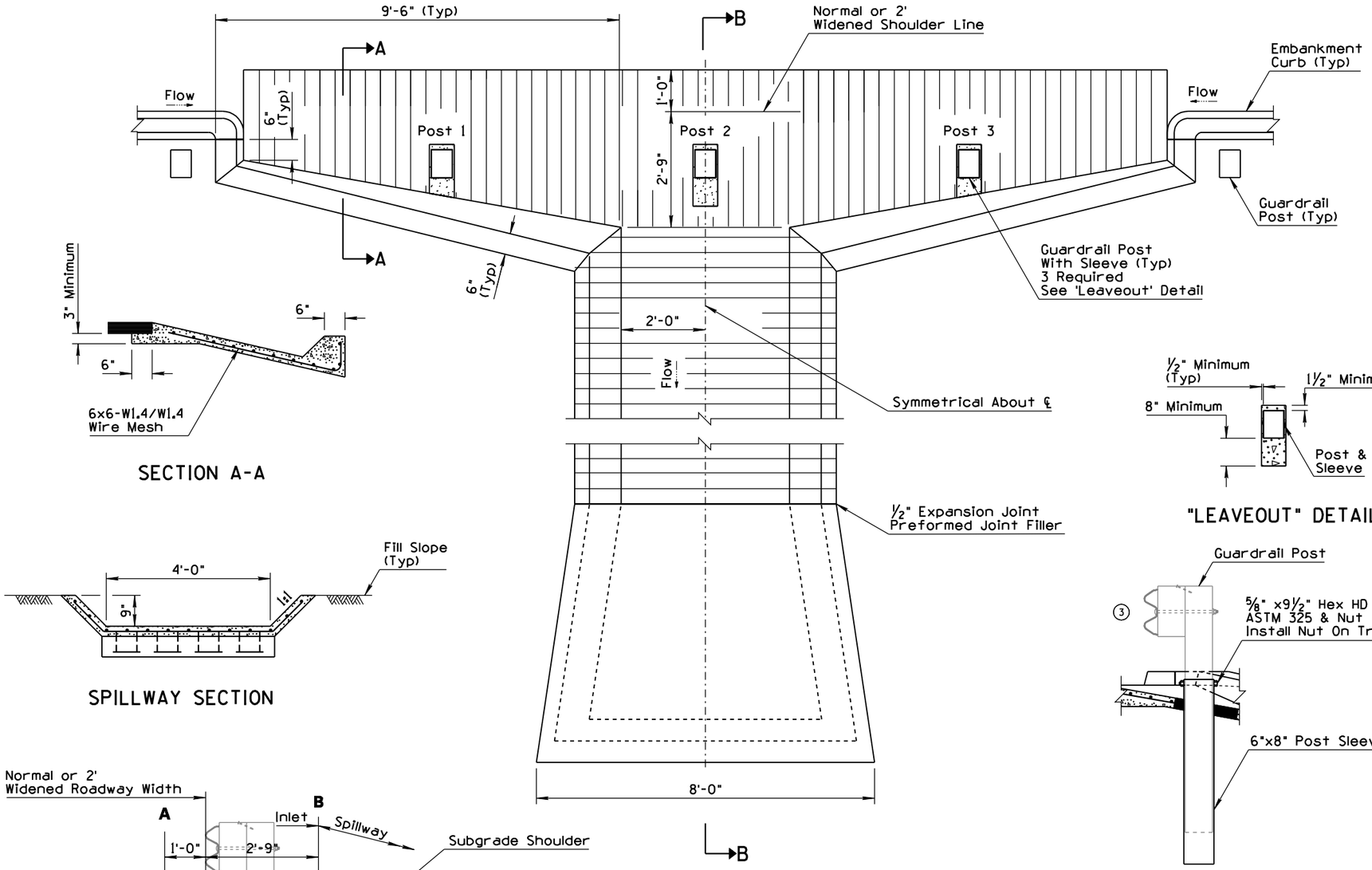


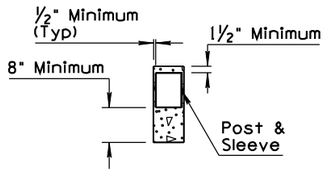
MINIMUM DITCH CONDITIONS DETAIL

APPROVED FOR DESIGN	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS	REV.
Mary Vipani		4/06
APPROVED FOR DISTRIBUTION	SLOPES (1) MISCELLANEOUS ROADWAYS	DRAWING NO. C-02.30

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	NEW STANDARD DRAWING	RLF	7/05
2	REVISED NOTE REFERENCE	RLF	4/06
3	SUBDUED POST / W-BEAM GRAPHICS	RLF	4/06
4			

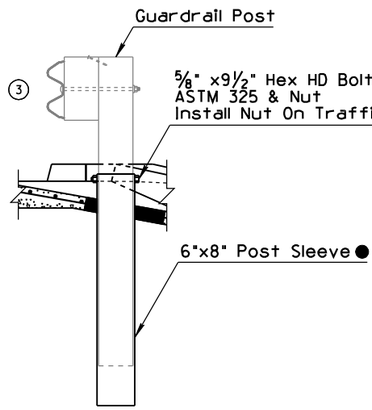


SECTION A-A

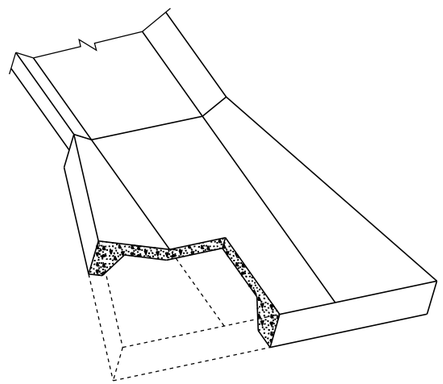


"LEAVEOUT" DETAIL

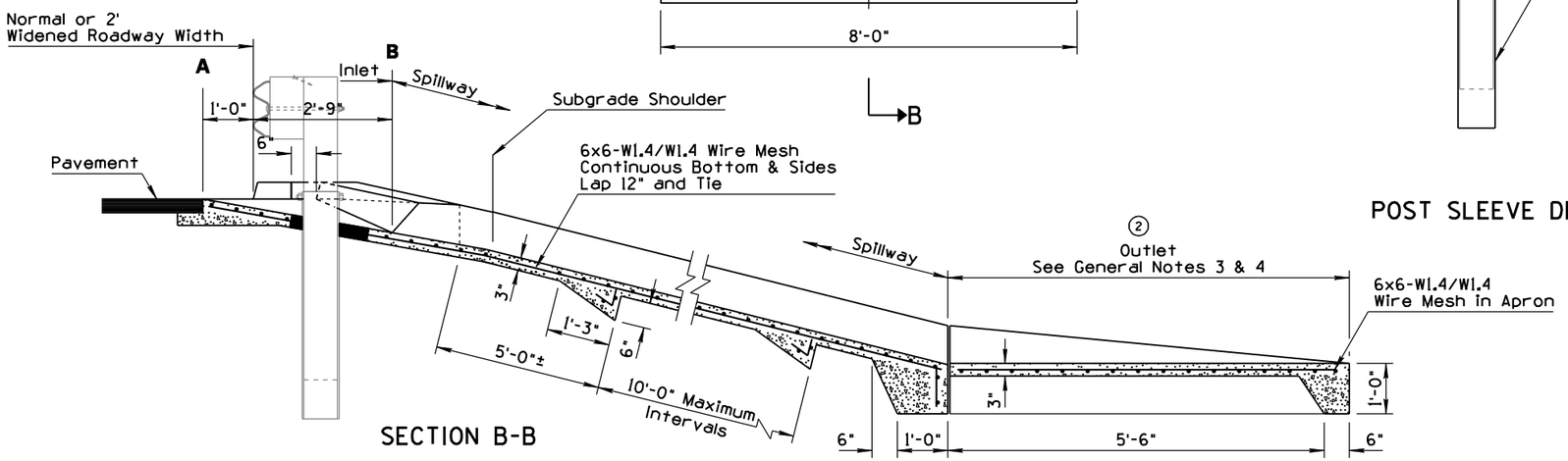
SPILLWAY SECTION



POST SLEEVE DETAIL



OUTLET DETAIL



SECTION B-B

GENERAL NOTES

1. Location may be adjusted to accomodate guardrail post layout.
2. All concrete shall be Class B. Embankment curb concrete shall be in accordance with the Std Specs.
3. Where rock is encountered the outlet may be omitted, as approved by the Engineer.
4. When outlet is used, the wire mesh shall extend through the joint into the outlet instead of bending into the key.
5. Spillway invert slope shall be uniformly downward from **A** to **B**. See Section B-B.
6. See Std Dwg C-04.30 for spillway length.
7. All posts within the inlet shall have a "leaveout" measuring a minimum of 1½" in front and ½" at each side, to the full depth of the concrete. The "leaveout" behind Posts 1 & 3 shall end at the toe of the curb. The "leaveout" behind Post 2 shall measure 8" minimum. After guardrail installation, the "leaveout" shall be filled with a one-sack grout mix or alternate material as approved by the Engineer.

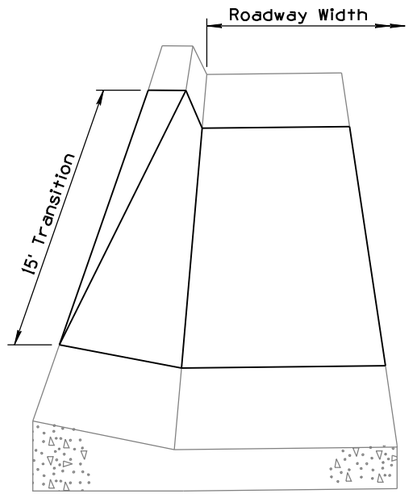
● Length may be 4'-6" or 5'-0".

Indicates Inlet

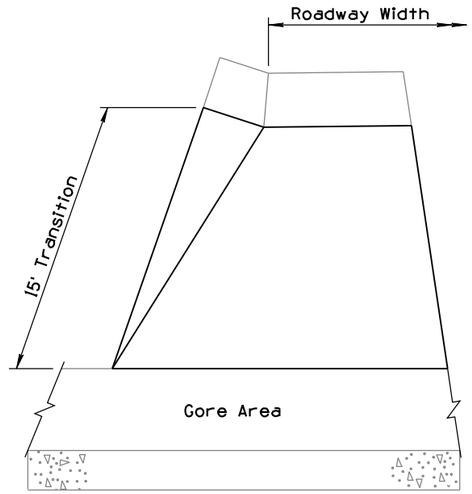
Indicates Spillway

APPROVED FOR DESIGN Mary Vipaina	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS	REV. 4/06
APPROVED FOR DISTRIBUTION	SPILLWAY, EMBANKMENT DOUBLE INLET	DRAWING NO. ① C-04.10 Sheet 2 of 2

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUED STANDARD DRAWING	RLF	7/05
2	REVISED NOTE	RLF	4/06
3			
4			



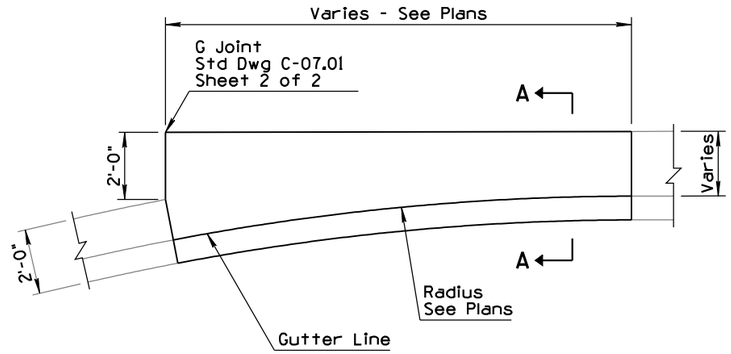
PERSPECTIVE



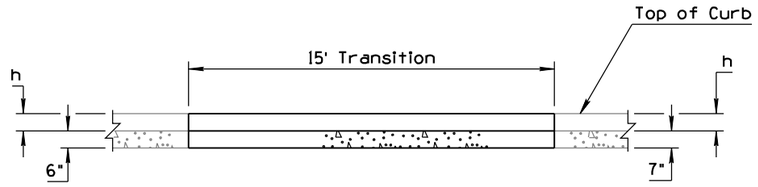
PERSPECTIVE

▲ Curb Height Varies 0" to 7" Maximum in Depressed Curb Area Beyond the End of Barrier. See Plans for Curb Height.

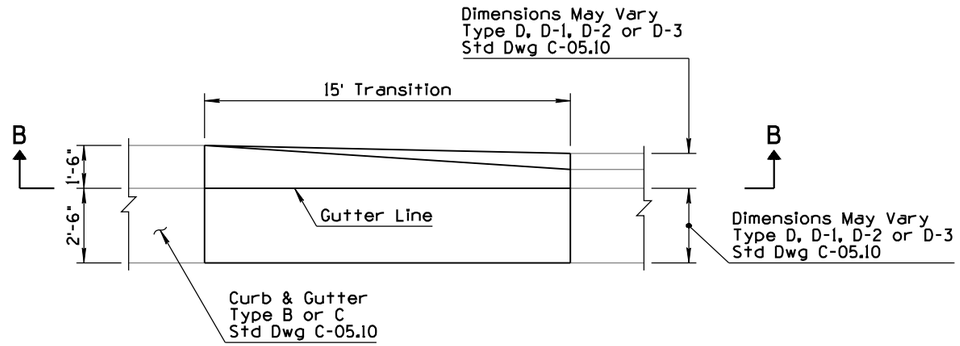
② ◪ Curb & Gutter Type B, C, C-1, D, D-1, D-2 or D-3



TYPE 4 - CURB & GUTTER TRANSITION

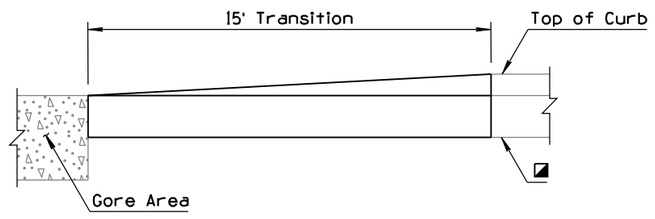


SECTION B-B

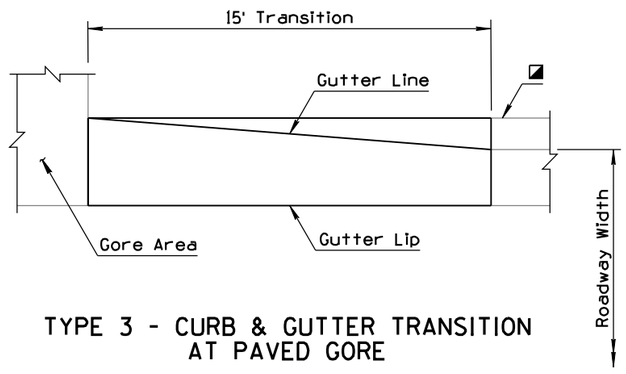


TYPE 2 - CURB & GUTTER TRANSITION

PLAN

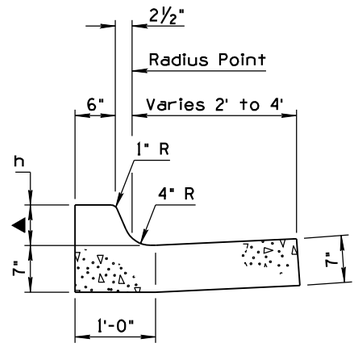


ELEVATION



TYPE 3 - CURB & GUTTER TRANSITION AT PAVED GORE

PLAN

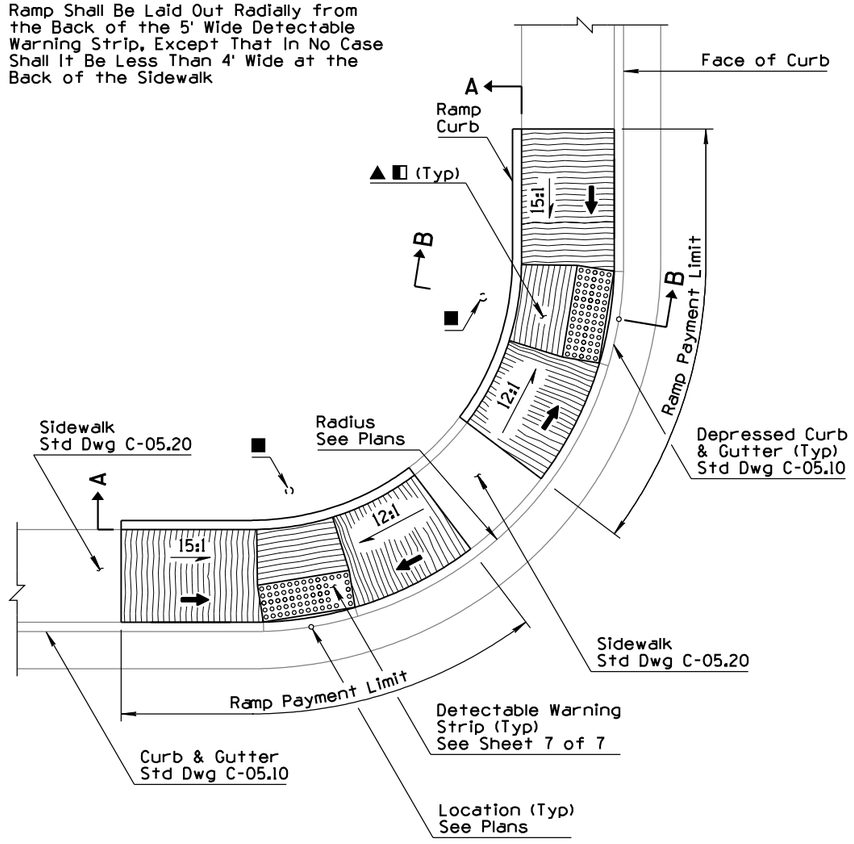


SECTION A-A

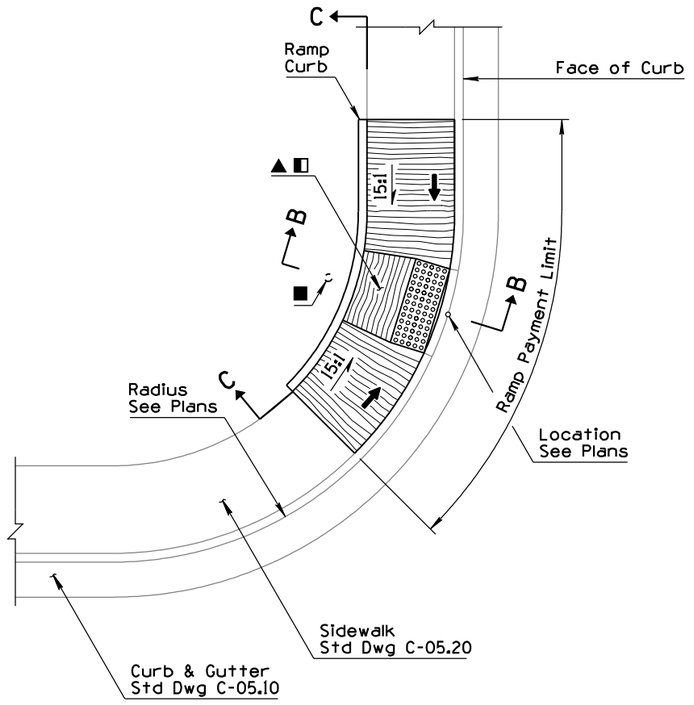
APPROVED FOR DESIGN	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS	REV. 4/06
API	CURB & GUTTER TRANSITIONS	DRAWING NO. ① C-05.12 Sheet 2 of 3

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUED STD DWG	RLF	4/06
2			
3			
4			

■ Ramp Shall Be Laid Out Radially from the Back of the 5' Wide Detectable Warning Strip, Except That In No Case Shall It Be Less Than 4' Wide at the Back of the Sidewalk



TWO CROSSING DIRECTIONS AT CORNER



ONE CROSSING DIRECTION AT CORNER

GENERAL NOTES

1. Ramp centerline shall be radial from the face of the curb at the Sidewalk Ramp Control Point.
2. The 12:1 and 15:1 ramp slopes shown are the steepest slopes allowed for a ramp 10 ft long or less. Where the 12:1 or 15:1 slopes would require the ramp to extend longer than 10 feet, the ramp may be limited to a 10 ft length with slopes steeper than 12:1 or 15:1. Ramp length is measured along the back of the sidewalk.
3. Drainage inlets should not be located within the marked crosswalks, or if crosswalks aren't marked, within the area a standard marked crosswalk would enclose.
4. Concrete shall receive a rough broom finish as shown.
5. See Std Dwgs C-05.10 and C-05.20 for joint details.
6. When installing brick detectable warning strips, the contractor shall take measures to avoid damaging the truncated domes. Bricks with damaged domes shall be replaced by the contractor at no additional cost.

● See Note 3

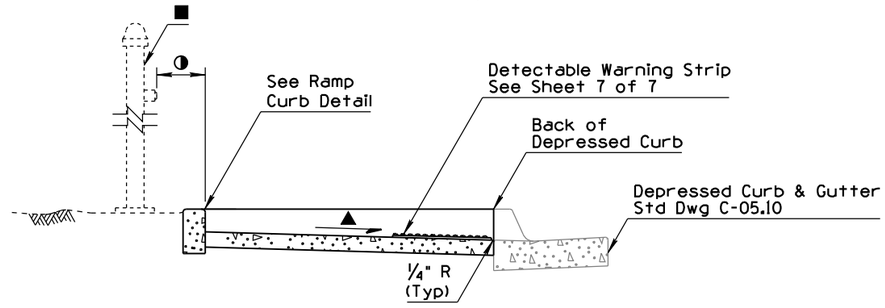
◑ 10" Maximum to Face of Pedestrian Push Button

■ Pedestrian Push Button Pole When Shown on Traffic Plans. See Traffic Signal Plans for Additional Information

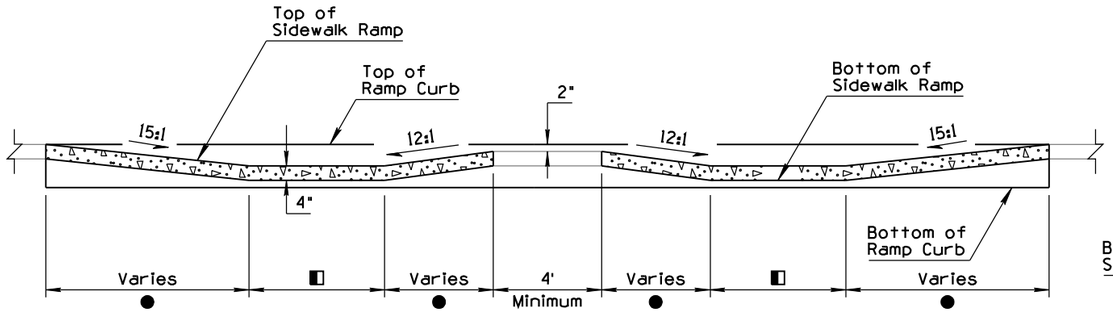
LEGEND

▲ Minimum Slope = 100:1 (0.01 '/ft)

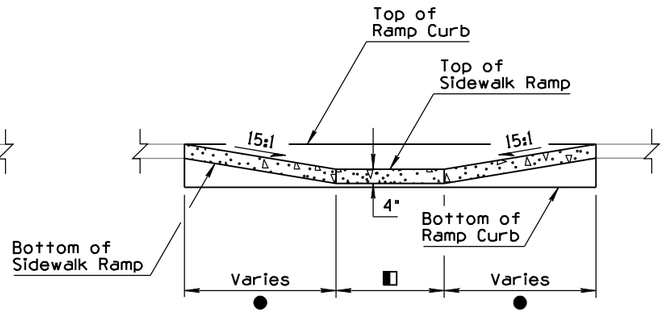
Maximum Slope = 50:1 (0.02 '/ft)



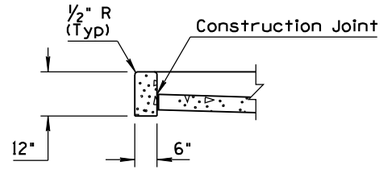
SECTION B-B



SECTION A-A



SECTION C-C

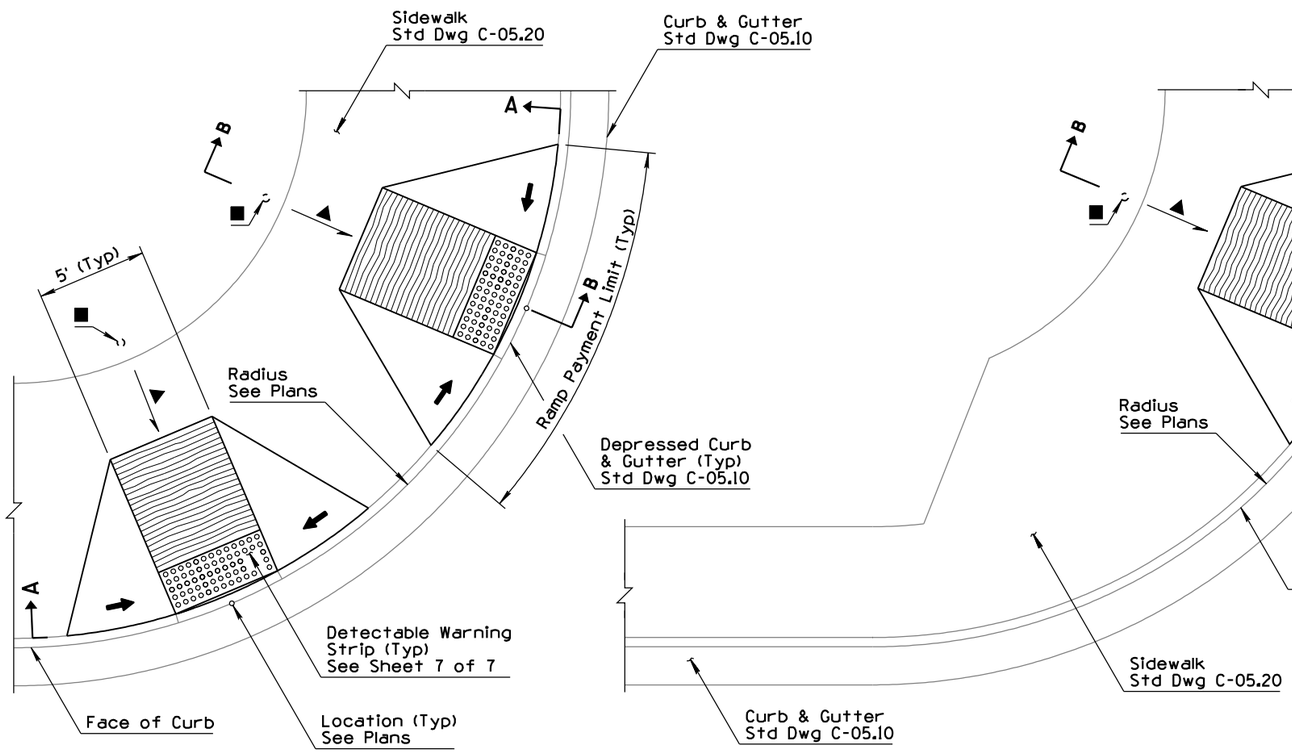


RAMP CURB DETAIL

PARALLEL SIDEWALK RAMP

APPROVED FOR DESIGN Mary Vipaina	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS	REV. 4/06
APPROVED FOR DISTRIBUTION	SIDEWALK RAMP TYPE A	DRAWING NO. ① C-05.30 Sheet 1 of 7

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUED STD DWG	RLF	4/06
2			
3			
4			



TWO CROSSING DIRECTIONS
AT CORNER

ONE CROSSING DIRECTION
AT CORNER

GENERAL NOTES

1. Ramp centerline shall be radial from the face of the curb at the sidewalk ramp control point.
2. The 15:1 ramp slope shown is the steepest slope allowed for a ramp 10 ft long or less. Where the 15:1 slope would require the ramp to extend longer than 10 feet, the ramp may be limited to a 10 ft length with slope steeper than 15:1. Ramp length is measured along the back of the sidewalk.
3. Drainage inlets should not be located within the marked crosswalks, or if crosswalks aren't marked, within the area a standard marked crosswalk would enclose.
4. Concrete shall receive a rough broom finish as shown. The side slope wings do not receive a broom finish.
5. The Engineer may approve replacing the side slope wing with a curb at a location where access to the side of a ramp run is blocked by a pole, utility box, other obstruction, or by a non-accessible surface such as a dirt planter strip.
6. See Std Dwgs C-05.10 and C-05.20 for joint details.
7. When installing brick detectable warning strips, the contractor shall take measures to avoid damaging the truncated domes. Bricks with damaged domes shall be replaced by the contractor at no additional cost.

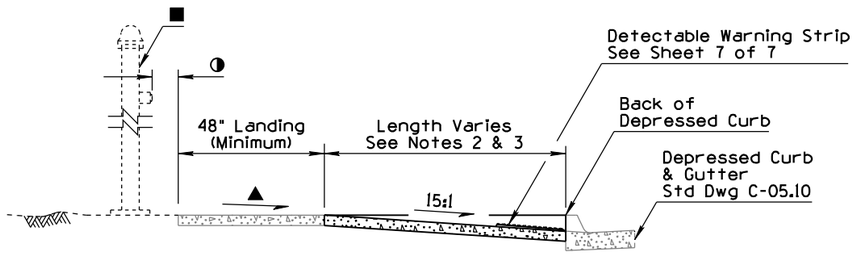
■ Pedestrian Push Button Pole When Shown on Traffic Plans. See Traffic Signal Plans for Additional Information

◑ 10" Maximum to Face of Pedestrian Push Button

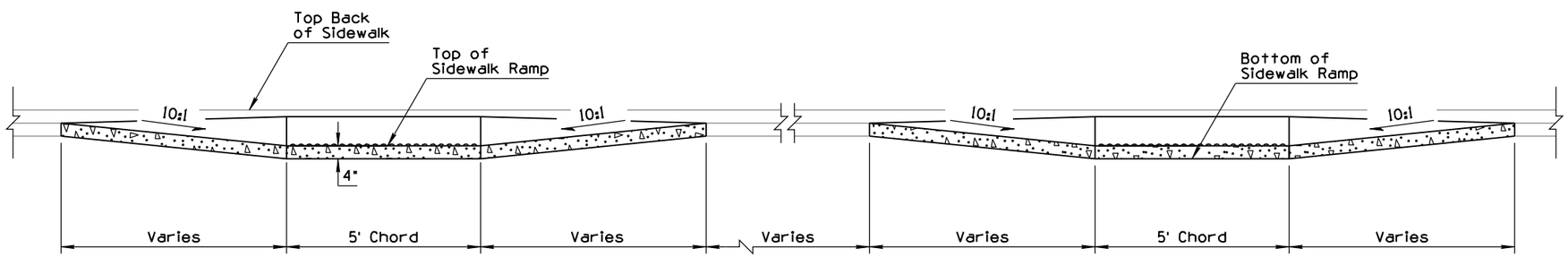
LEGEND

Minimum Slope = 100:1 (0.01 '/ft)

Maximum Slope = 50:1 (0.02 '/ft)



SECTION
B-B



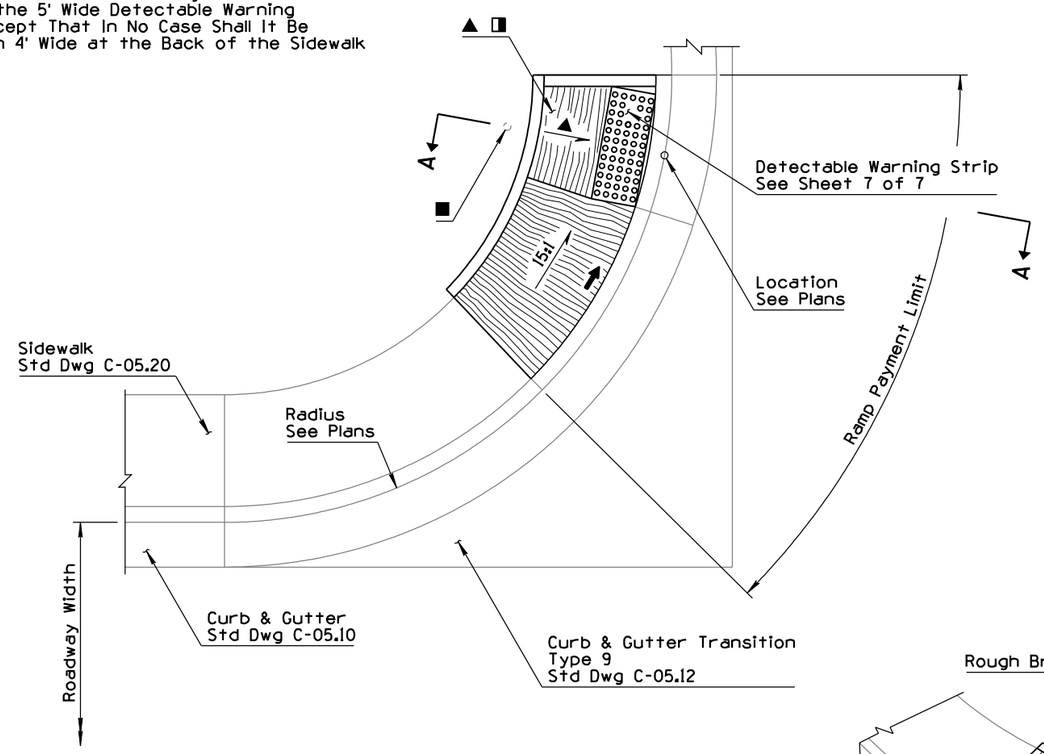
SECTION
A-A

PERPENDICULAR CURB RAMP

APPROVED FOR DESIGN Mary Viparina	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS	REV. 4/06
APPROVED FOR DISTRIBUTION John Bernard	SIDEWALK RAMP TYPE B	DRAWING NO. (1) C-05.30 Sheet 2 of 7

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUED STD DWG	RLF	4/06
2			
3			
4			

■ Ramp Shall Be Laid Out Radially from the Back of the 5' Wide Detectable Warning Strip, Except That In No Case Shall It Be Less Than 4' Wide at the Back of the Sidewalk



GENERAL NOTES

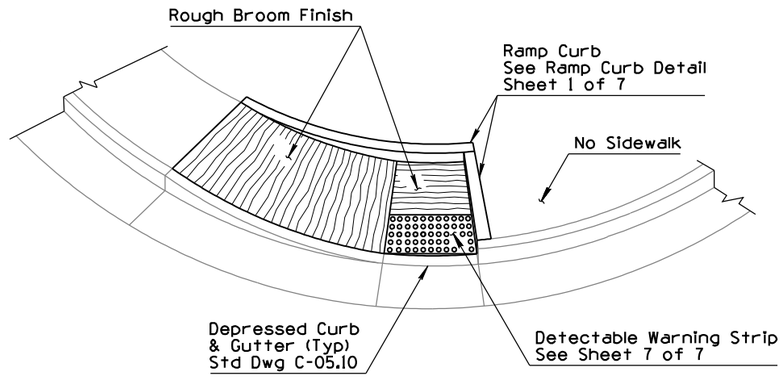
1. For use where sidewalk is not continuous.
2. Ramp centerline shall be radial from the face of the curb at the Sidewalk Ramp Control Point.
3. The 15:1 ramp slope shown is the steepest slope allowed for a ramp 10 ft long or less. Where the 15:1 slope would require the ramp to extend longer than 10 feet, the ramp may be limited to a 10 ft length with slope steeper than 15:1. Ramp length is measured along the back of the sidewalk.
4. The top of the Ramp Curb along the back of the Sidewalk Ramp shall match the elevation of the adjacent back of sidewalk and run parallel to the Sidewalk Ramp. The Ramp Curb along the side of the Sidewalk Ramp shall match the elevation at the back of the Curb & Gutter and the back of Ramp Curb.
5. Drainage inlets should not be located within the marked crosswalks, or if crosswalks aren't marked, within the area a standard marked crosswalk would enclose.
6. Concrete shall receive a rough broom finish as shown.
7. See Std Dwgs C-05.10 and C-05.20 for joint details.
8. When installing brick detectable warning strips, the contractor shall take measures to avoid damaging the truncated domes. Bricks with damaged domes shall be replaced by the contractor at no additional cost.

■ Pedestrian Push Button Pole When Shown on Traffic Plans. See Traffic Signal Plans for Additional Information

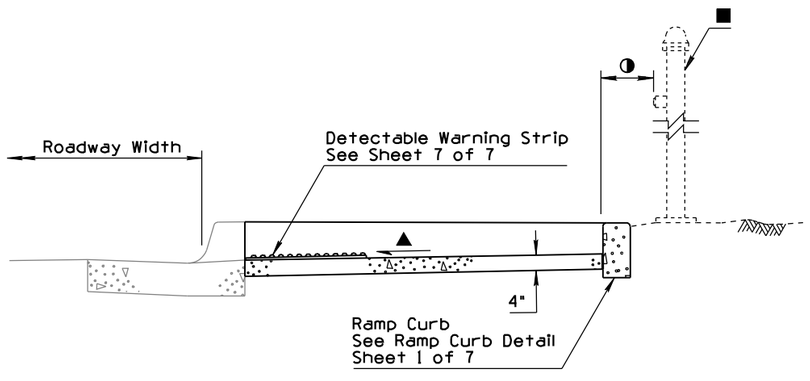
◑ 10" Maximum to Face of Pedestrian Push Button

LEGEND

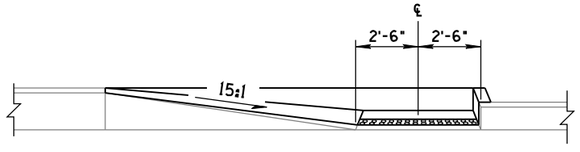
▲ Minimum Slope = 100:1 (0.01 '/ft)
Maximum Slope = 50:1 (0.02 '/ft)



PERSPECTIVE



SECTION A-A



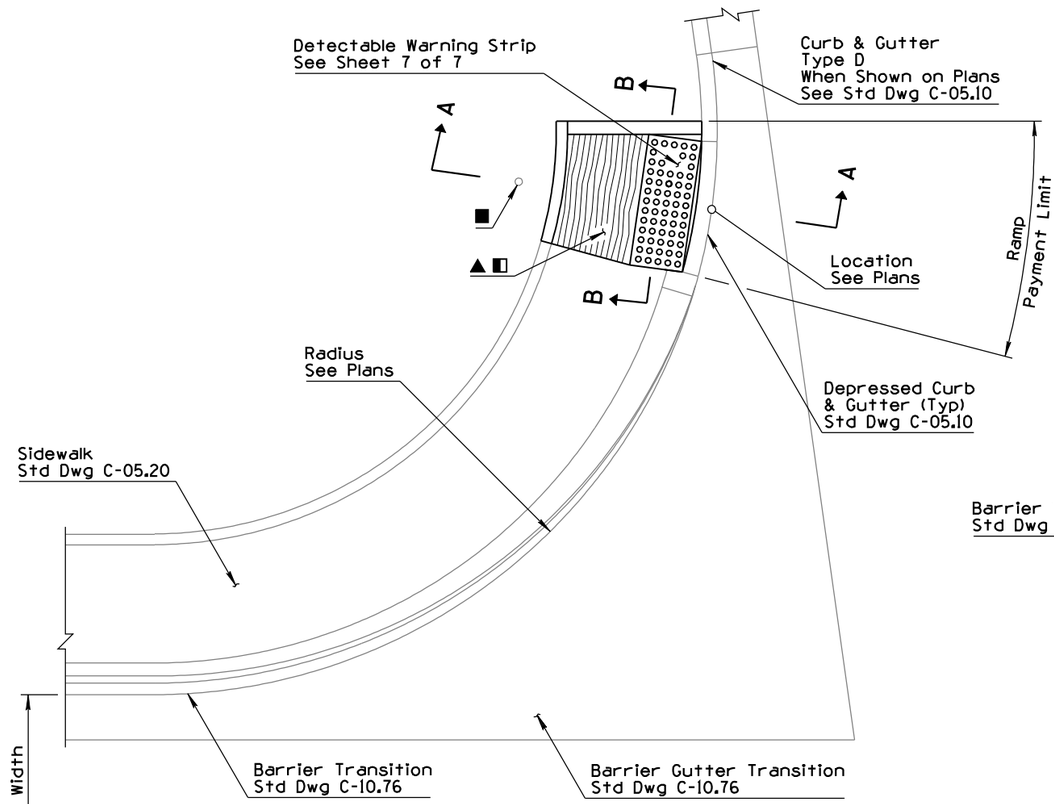
ELEVATION
DEPRESSED CURB AT SIDEWALK RAMP

SIDEWALK RAMP AT SIDEWALK TERMINUS

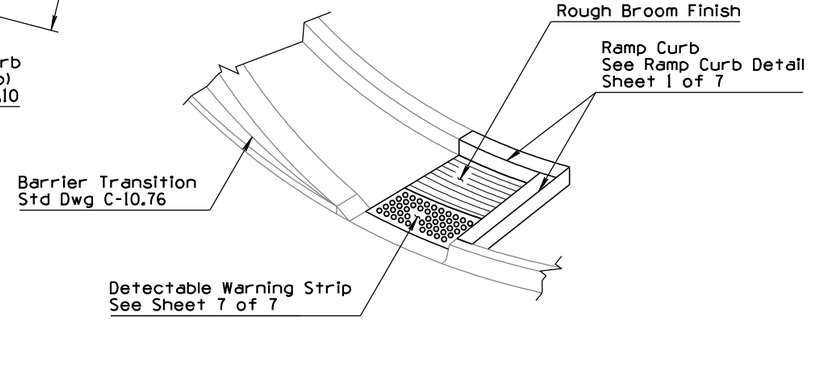
APPROVED FOR DESIGN Mary Viparina	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS	REV. 4/06
APPROVED FOR DISTRIBUTION John Bernard	SIDEWALK RAMP TYPE C	DRAWING NO. (1) C-05.30 Sheet 3 of 7

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUED STANDARD DRAWING	RLF	4/06
2			
3			
4			

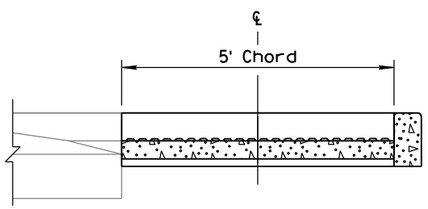
■ Ramp Shall Be Laid Out Radially from the Back of the 5' Wide Detectable Warning Strip, Except That In No Case Shall It Be Less Than 4' Wide at the Back of the Sidewalk



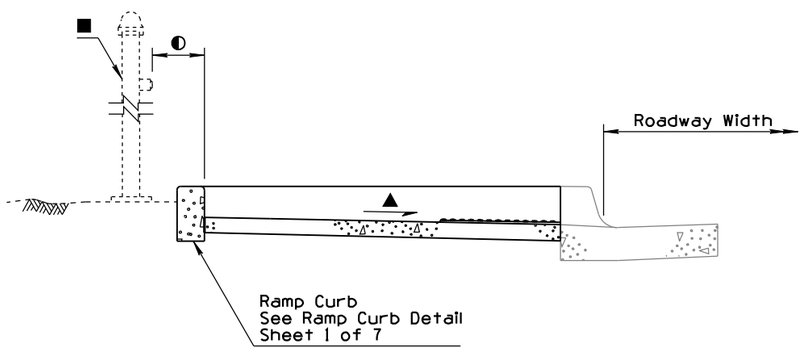
PLAN



PERSPECTIVE



SECTION B-B



SECTION A-A

GENERAL NOTES

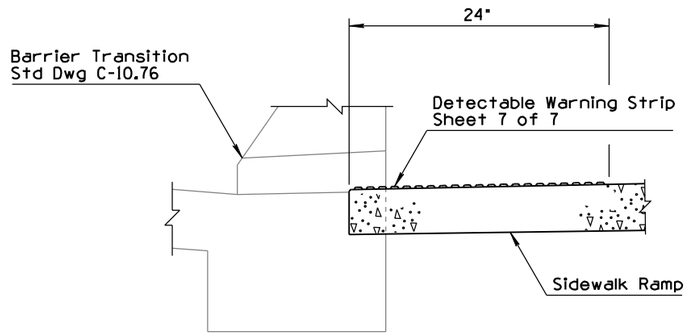
1. For use where sidewalk is not continuous.
2. Ramp centerline shall be radial from the face of the curb at the Sidewalk Ramp Control Point.
3. The top of the Ramp Curb along the back of the Sidewalk Ramp shall match the elevation of the adjacent back of sidewalk and run parallel to the Sidewalk Ramp. The Ramp Curb along the side of the Sidewalk Ramp shall match the elevation at the back of the Curb & Gutter and the back of Ramp Curb.
4. Drainage inlets should not be located within marked crosswalks, or if crosswalks aren't marked, within the area a standard marked crosswalk would enclose.
5. Concrete shall receive a rough broom finish as shown.
6. See Std Dwgs C-05.10 and C-05.20 for joint details.
7. When installing brick detectable warning strips, the contractor shall take measures to avoid damaging the truncated domes. Bricks with damaged domes shall be replaced by the contractor at no additional cost.

■ Pedestrian Push Button Post When Shown on Traffic Plans. See Traffic Signal Plans for Additional Information

◑ 10" Maximum to Face of Pedestrian Push Button

LEGEND

▲ Minimum Slope = 100:1 (0.01 '/ft)
Maximum Slope = 50:1 (0.02 '/ft)

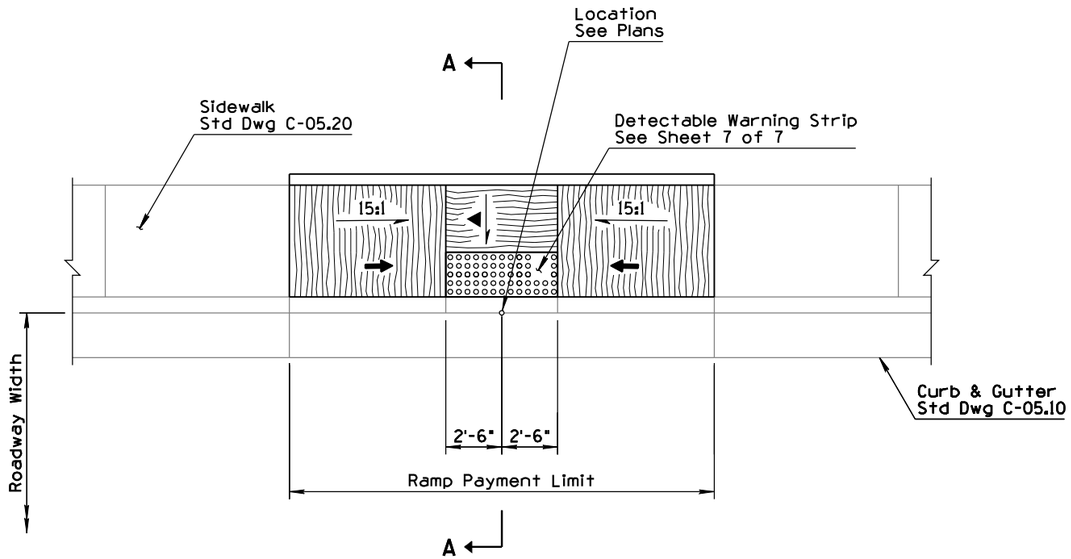


DETAIL

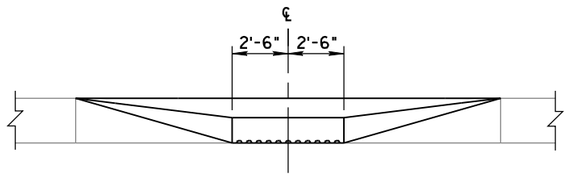
SIDEWALK RAMP AT SIDEWALK TERMINUS SIDEWALK BEHIND BARRIER

APPROVED FOR DESIGN Mary Vipaina	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS	REV. 4/06
APPROVED FOR DISTRIBUTION	SIDEWALK RAMP TYPE D	DRAWING NO. (1) C-05.30 Sheet 4 of 7

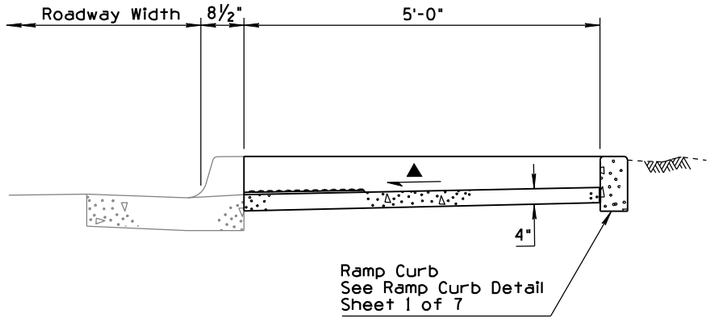
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUED STD DWG	RLF	4/06
2			
3			
4			



PLAN



ELEVATION
DEPRESSED CURB AT SIDEWALK RAMP



SECTION A-A

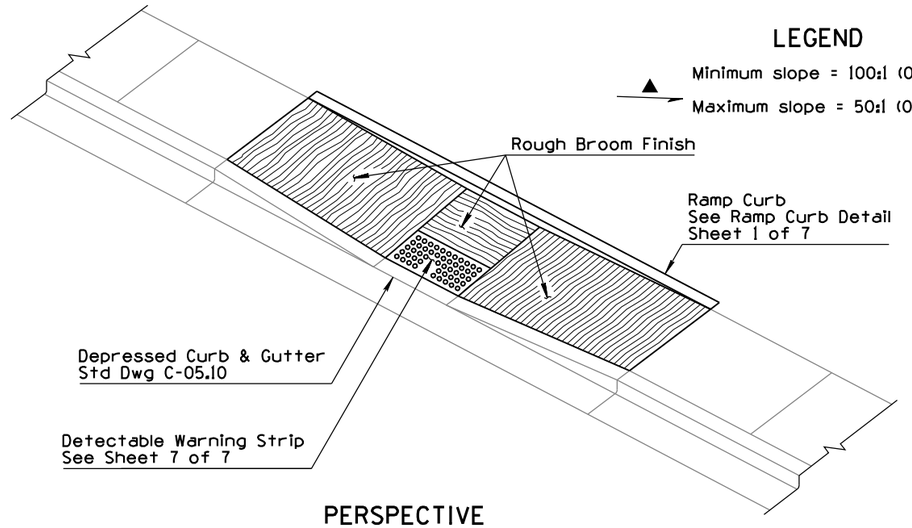
GENERAL NOTES

1. For use at mid-block locations.
2. Ramp centerline shall be perpendicular to the face of the curb at the Sidewalk Ramp Control Point.
3. The 15:1 ramp slope shown is the steepest slope allowed for a ramp 10 ft long or less. Where the 15:1 slope would require the ramp to extend longer than 10 feet, the ramp may be limited to a 10 ft length with slope steeper than 15:1. Ramp length is measured along the back of the sidewalk.
4. For sidewalk widths greater than shown on C-05.20, the overall Sidewalk Ramp depth shall match the sidewalk width.
5. Ramp curb height to match elevation at back of adjacent sidewalk.
6. Drainage inlets should not be located within the marked crosswalks, or if crosswalks aren't marked, within the area a standard marked crosswalk would enclose.
7. Concrete shall receive a rough broom finish as shown.
8. See Std Dwgs C-05.10 and C-05.20 for joint details.
9. When installing brick detectable warning strips, the contractor shall take measures to avoid damaging the truncated domes. Bricks with damaged domes shall be replaced by the contractor at no additional cost.

LEGEND

Minimum slope = 100:1 (0.01 '/ft)

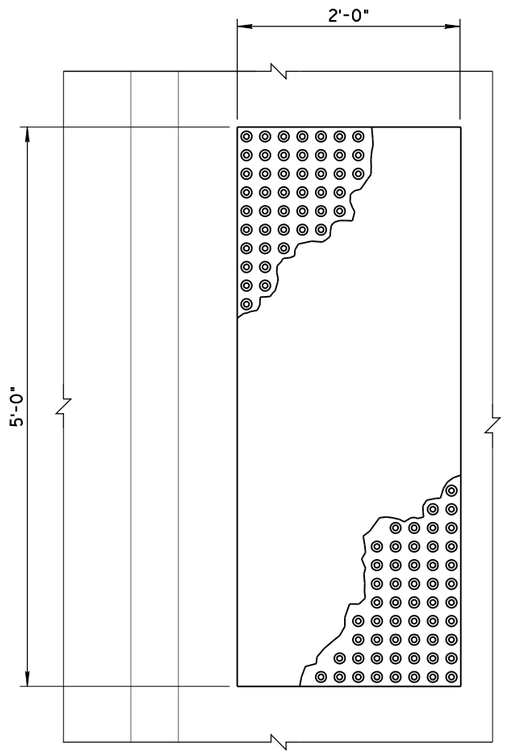
Maximum slope = 50:1 (0.02 '/ft)



PERSPECTIVE

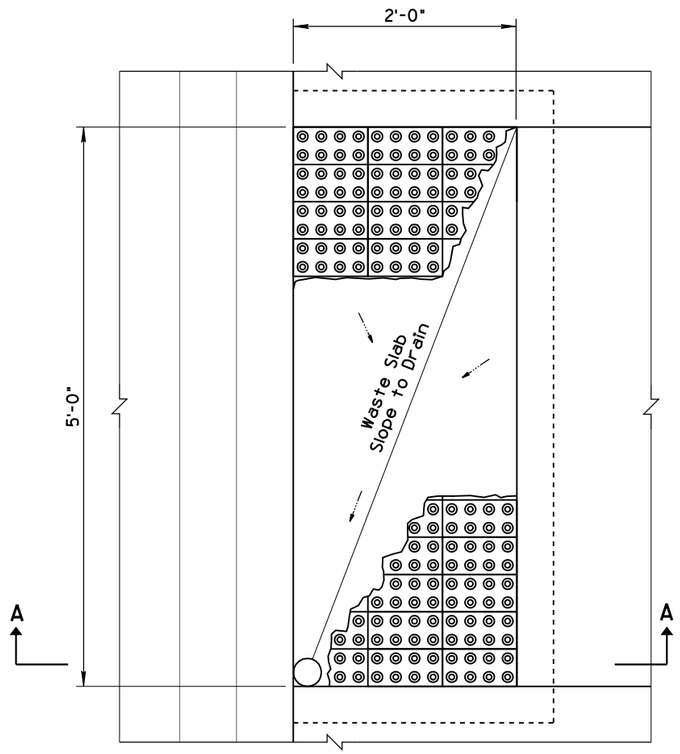
APPROVED FOR DESIGN	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS	REV.
Mary Vipaina		4/06
APPROVED FOR DISTRIBUTION	SIDEWALK RAMP TYPE E	DRAWING NO. 1 C-05.30 Sheet 5 of 7

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	ADDED PLAN & SECTION FOR BRICK OPTION	RLF	4/06
2	REVISED TITLE	RLF	4/06
3			
4			



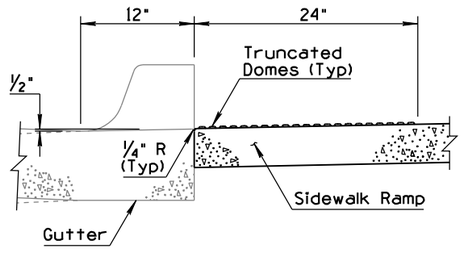
DETECTABLE WARNING STRIP

PLAN

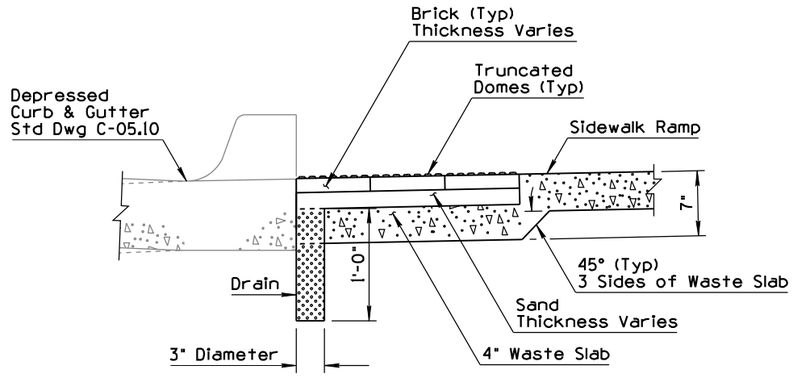


DETECTABLE WARNING STRIP
BRICK OPTION

① PLAN



SECTION ②



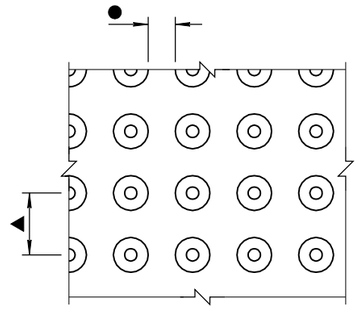
SECTION
①

GENERAL NOTES

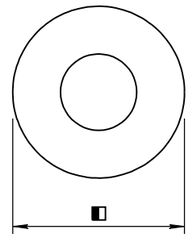
1. Drain shall be placed in low corner and filled with coarse aggregate (AASHTO N43 Size 7) securely tied in a long-life geotextile sack.

LEGEND

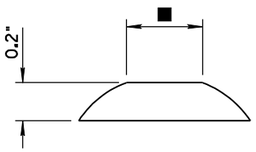
- ● 11/16 " Minimum (Typ) (0.65" Minimum ADA Actual)
- ▲ 1 5/8" to 2 3/8" (Typ) (1.6" to 2.4" ADA Actual)
- ◧ 7/8" to 1 3/8" (Typ) (0.9" to 1.4" ADA Actual)
- ■ 50% to 65% of ◧



TEXTURE PATTERN DETAIL



PLAN ②

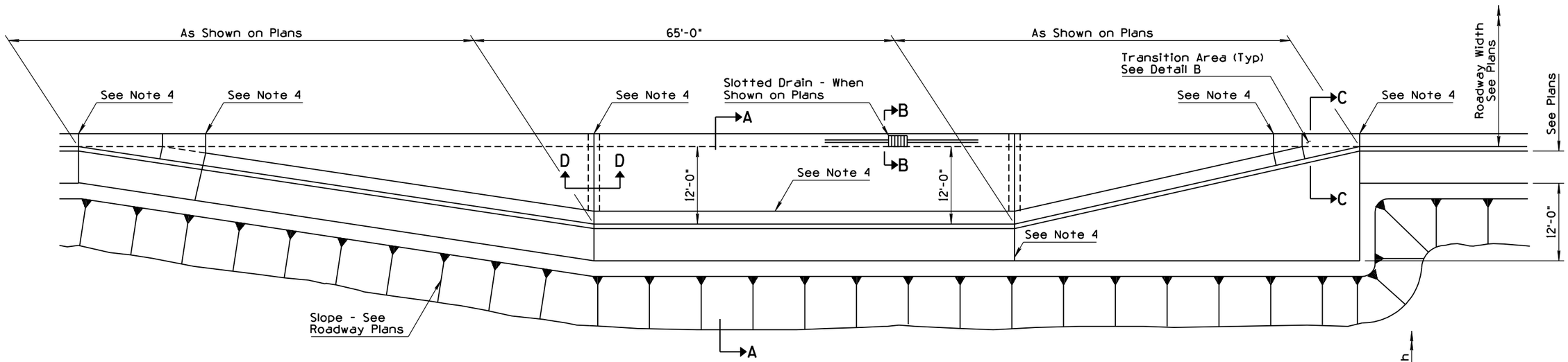


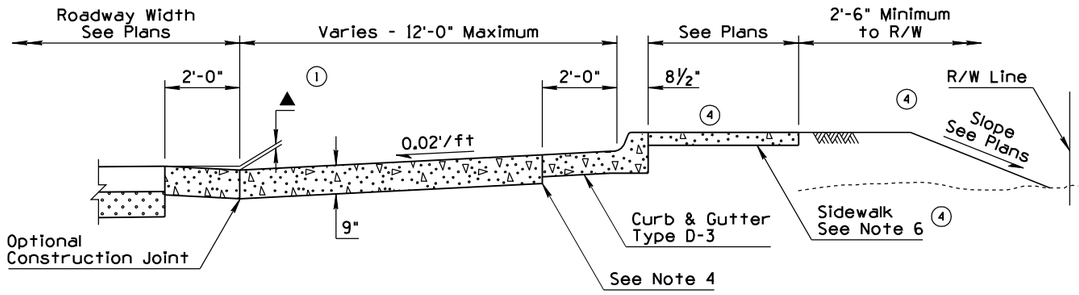
ELEVATION ②

TRUNCATED DOME DETAIL
②

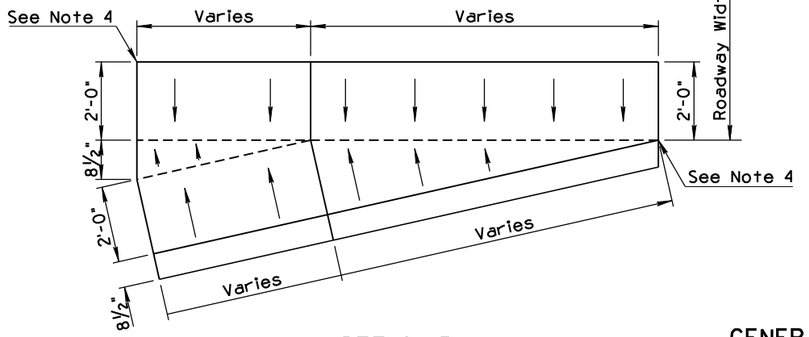
APPROVED FOR DESIGN Mary Viparina	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS	REV. 4/06
APPROVED FOR DISTRIBUTION John Bernard	SIDEWALK RAMP DETECTABLE WARNING STRIP	DRAWING NO. C-05.30 Sheet 7 of 7

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	MODIFIED GUTTER DEPRESSION VALUE & ADDED NOTE	RLF	9/04
2	MODIFIED REFERENCE	RLF	4/06
3	REVISED NOTE	RLF	4/06
4	MODIFIED SECTION A-A	RLF	4/06

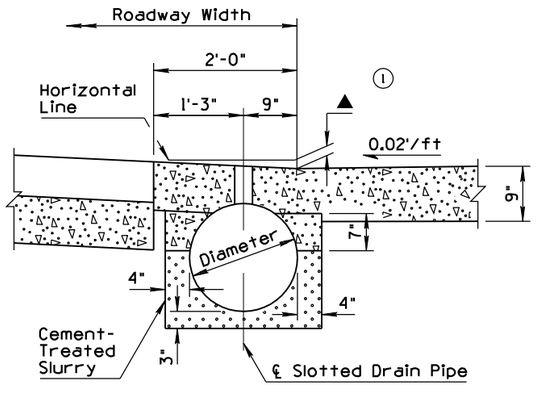




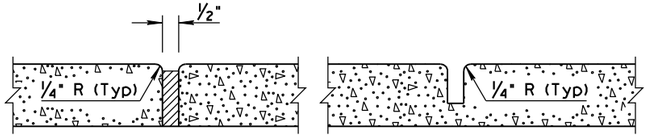
SECTION A-A



DETAIL B
TRANSITION AREA

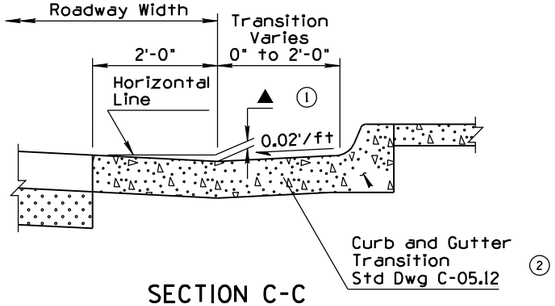


SECTION B-B

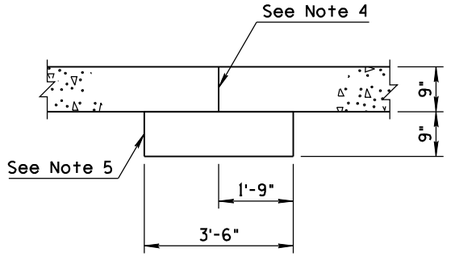


EXPANSION JOINT CONTRACTION JOINT

DETAIL A



SECTION C-C



SECTION D-D

GENERAL NOTES

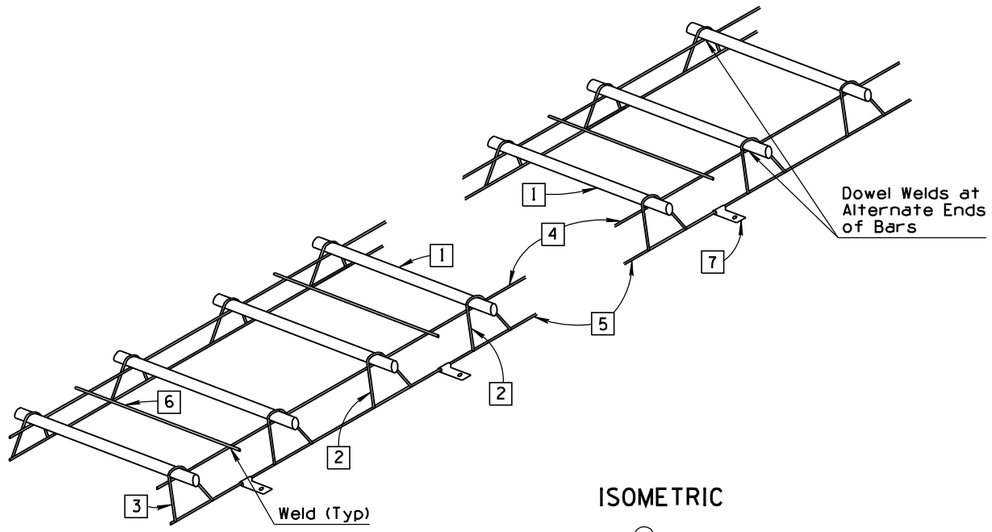
1. The PCCP surfaces within the bus bay area shall be textured transversly. Surface texturing to conform to Std Spec 401.
2. Transverse weakened plane joints shall be constructed at a maximum spacing of 15' and shall align with joints in the concrete curb and gutter.
3. For additional data on slotted drains, see Std Dwg C-13.60.
4. For ½" expansion joint with preformed joint fillers, see Detail A.
5. Concrete pad to be poured separately from concrete bus bay pavement.

(3) 6. See Std Dwg C-05.20 for sidewalk construction.

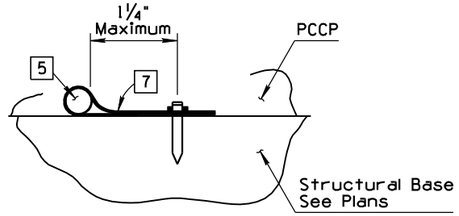
(1) ▲ See Plans: match the adjacent gutter depression

APPROVED FOR DESIGN	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS	REV. 4/06
APPROVED FOR DISTRIBUTION	CONCRETE BUS BAY	DRAWING NO. C-05.50

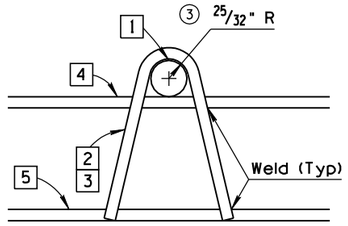
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	MODIFIED TABLE MEASUREMENT FORMAT	RLF	9/04
2	CHANGED REFERENCE TO C-07.04	RLF	4/06
3	REVISED TITLE	RLF	4/06
4			



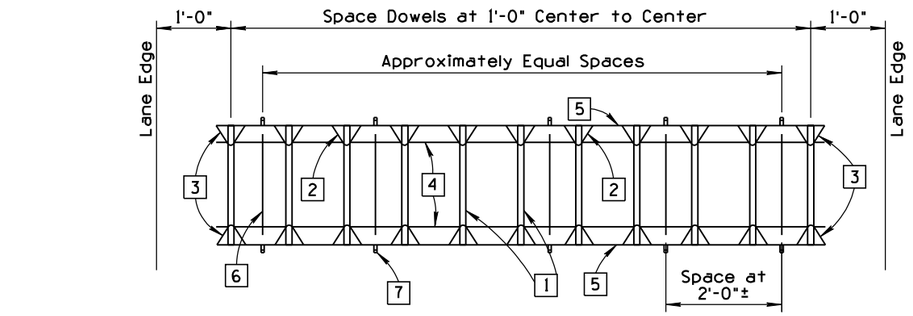
ISOMETRIC ③



ANCHOR STRAP DETAIL

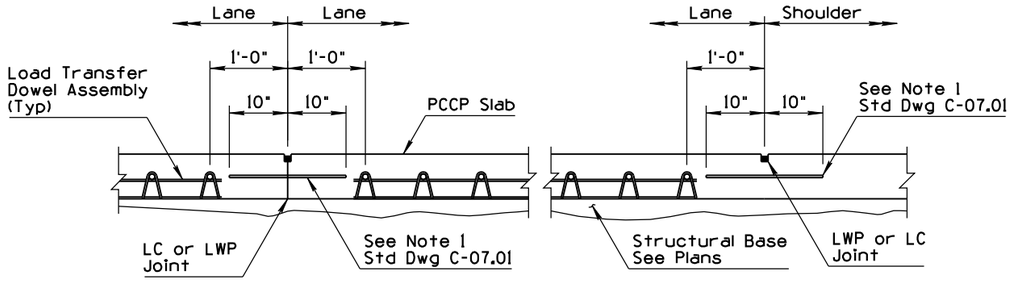


END AND INTERMEDIATE LEG DETAIL



PLAN ③

TRANSVERSE WEAKENED-PLANE JOINT WITH LOAD TRANSFER DOWEL ASSEMBLY



PLACEMENT AND EDGE CLEARANCE DETAIL ③

GENERAL NOTES

1. Load transfer dowel assemblies shall be used with non-skewed PCCP joints.
2. Load transfer dowel assemblies are to be placed at each transverse weakened plane joint on the traveled lanes as shown on the plans.
3. ② See Std Dwgs C-07.01 through C-07.04 for additional information.
4. ② See plans or Std Dwgs C-07.03 through C-07.04 for transverse joint spacing.
5. See plans for pavement thickness less than 12" or greater than 14".

Load transfer dowel assembly shall be assembled from the following materials: (See Quantity Table)

- [1] Dowel bars - 1½" diameter x 1'-6" plain round bars with coating. See Special Provisions.
- [2] Intermediate legs - 2 gauge or W-5.5 wire.
- [3] End legs - 2 gauge or W-5.5 wire.
- [4] Upper space bar - 2 gauge or W-5.5 wire x ◑. (See Dimension Table)
- [5] Lower space bar - 2 gauge or W-5.5 wire x ◑. (See Dimension Table)
- [6] Tie bars - W-1.5 wire x 16".
- [7] Anchor strap - 1"x3" steel strap, 0.079 thick. Place with a 1½" minimum length steel nail for LCB, 4" minimum length steel nail for ACB or AB, 0.145 diameter ASTM A227 Class 1 with ¼" head or washer.

①

QUANTITY TABLE

Item No	Lane Width (Ft)		
	12	14	16
[1]	11	13	15
[2]	18	22	26
[3]	4	4	4
[4]	2	2	2
[5]	2	2	2
[6]	5	6	7
[7]	10	12	14

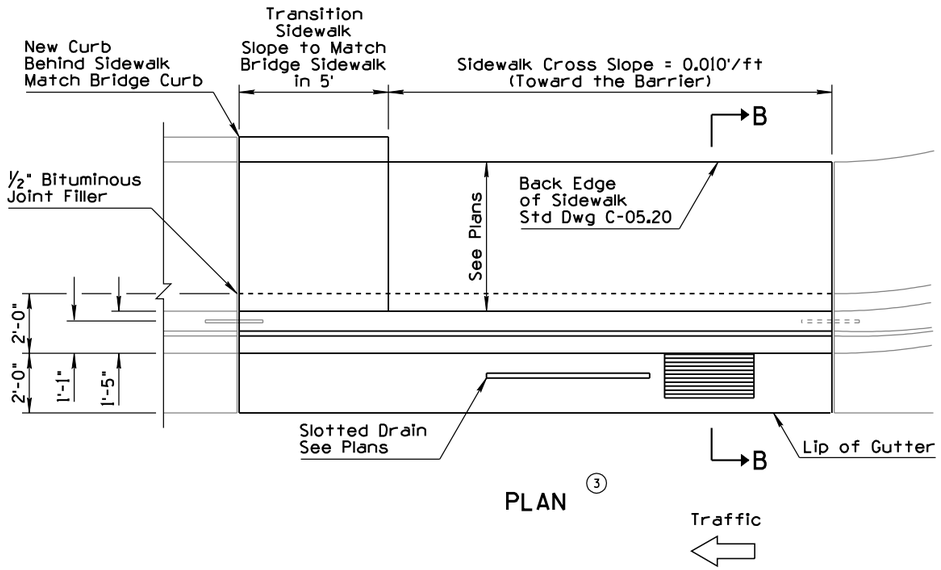
①

DIMENSION TABLE

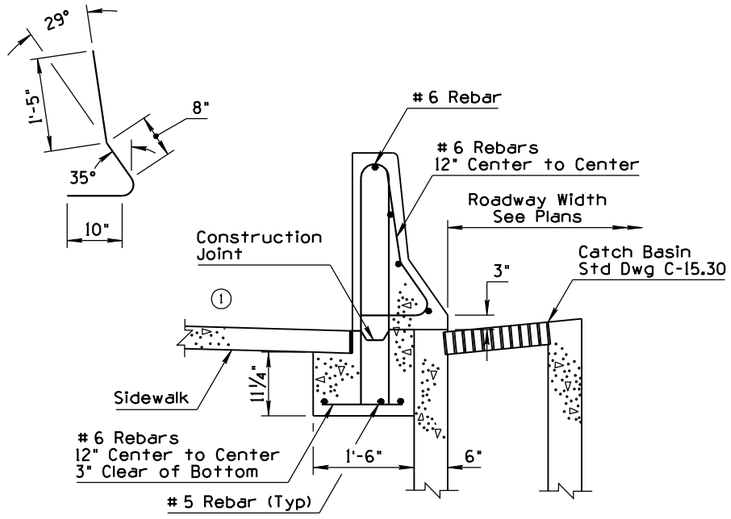
	Lane Width (Ft)		
	12	14	16
◑ (Ft-In))	10-4	12-4	14-4

APPROVED FOR DESIGN Mary Vipaina	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS	REV. 4/06
APPROVED FOR DISTRIBUTION	LOAD TRANSFER DOWEL ASSEMBLY	DRAWING NO. C-07.02

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	MODIFIED SECTION VIEWS: REMOVED SLOPE DESIGNATION	RLF	4/06
2	WAS 12½" - IS NOW 1' & ADDED WITHOUT GUARDRAIL TO TITLE	RLF	4/06
3	MODIFIED TITLE	RLF	4/06
4			



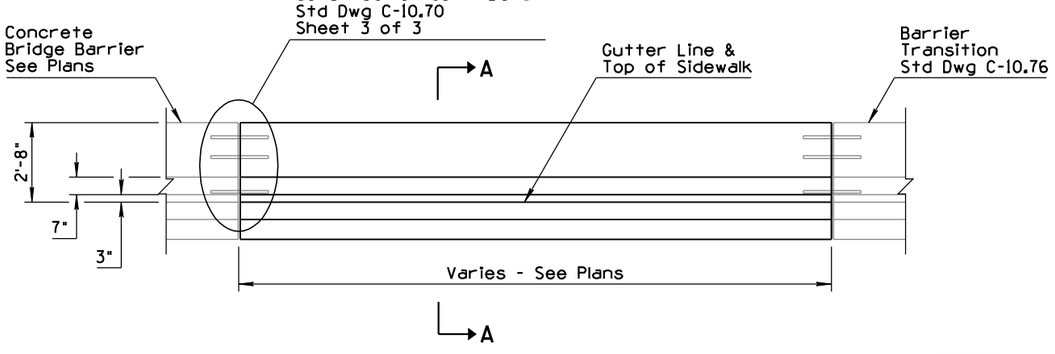
PLAN ③



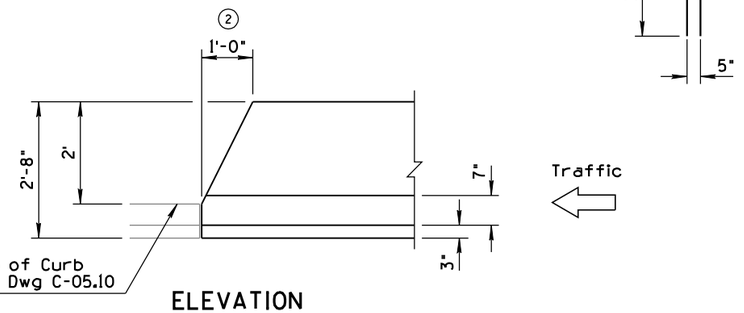
SECTION B-B
AT CATCH BASINS

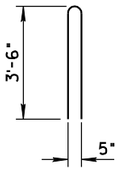
GENERAL NOTES

1. Concrete shall be Class S, f'c=4000 PSI.
2. Rebar shall conform to Std Spec 1003.
3. Rebar shall have 2" minimum clear cover unless otherwise noted.
4. See drainage sheets for slotted drain and catch basin details.
5. Departure termination may be substituted for Std Dwg C-10.76 barrier transition under departure conditions.
6. See Std Dwg C-05.20 for sidewalk construction.
7. All bend dimensions for rebar are out-to-out of rebars.

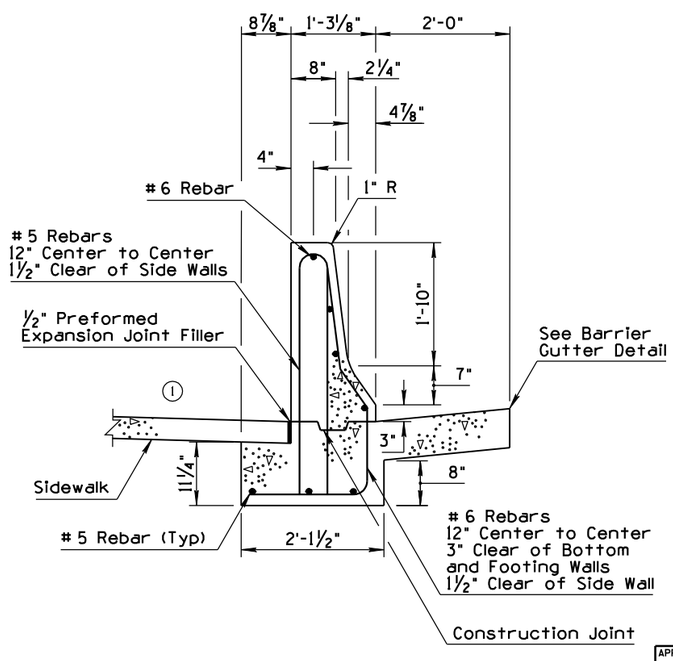


ELEVATION

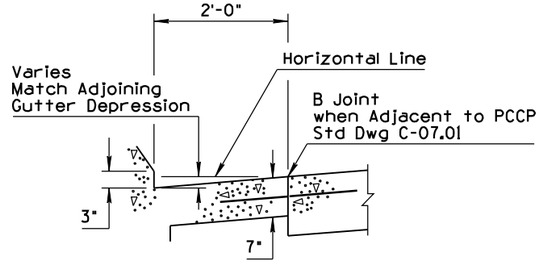




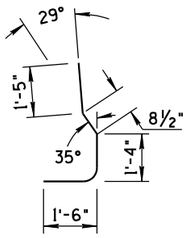
ELEVATION
DEPARTURE TERMINATION WITHOUT GUARDRAIL



SECTION A-A

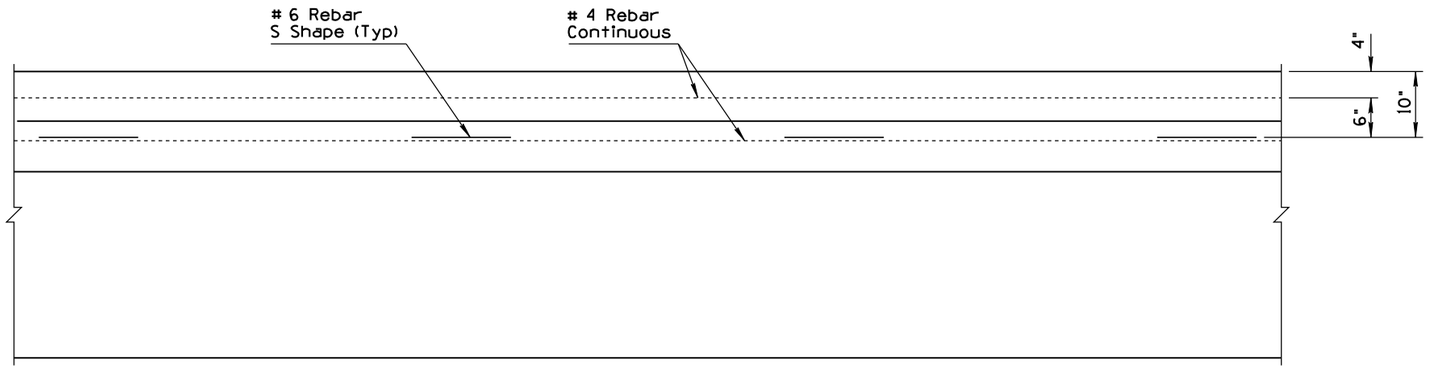


BARRIER GUTTER DETAIL

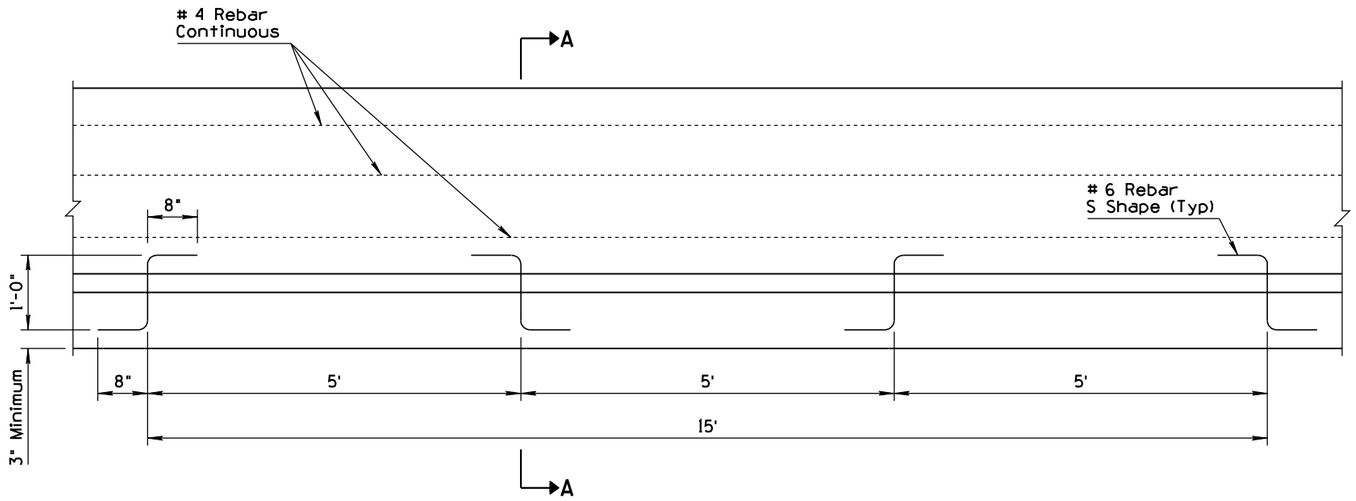


APPROVED FOR DESIGN Mary Viparina	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS	REV. 4/06
APPROVED FOR DISTRIBUTION	CONCRETE HALF BARRIER 32' TYPE 'F' WITH SIDEWALK	DRAWING NO. C-10.51

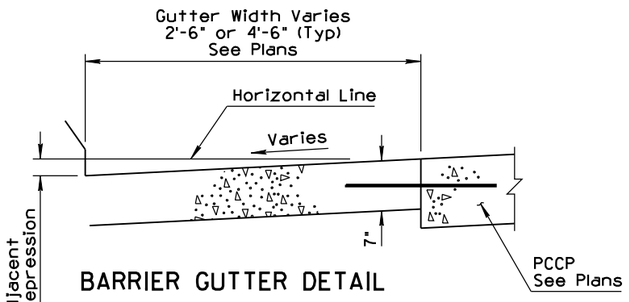
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REMOVED D REFERENCE FROM GENERAL NOTE	RLF	4/06
2			
3			
4			



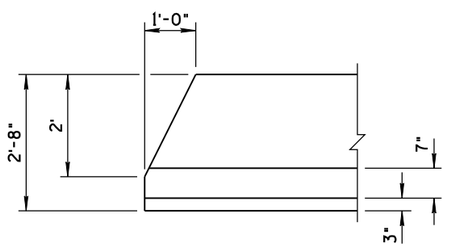
PLAN



ELEVATION



BARRIER GUTTER DETAIL

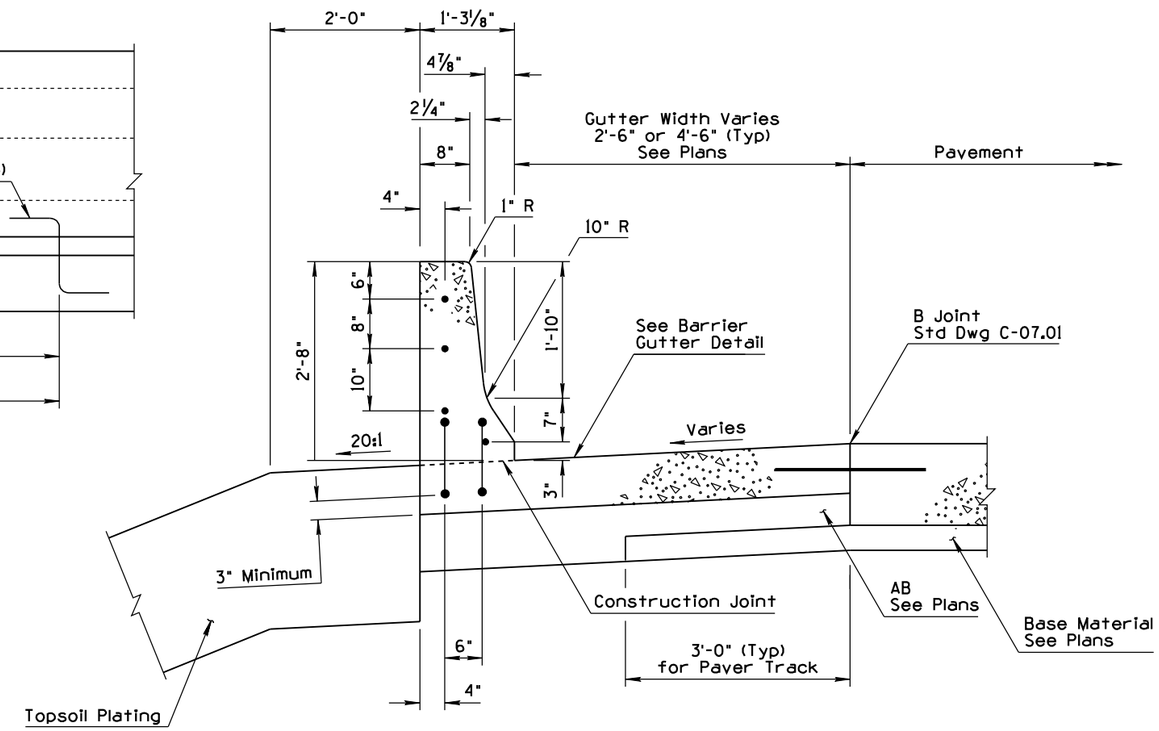


Traffic

ELEVATION
DEPARTURE TERMINATION WITHOUT GUARDRAIL

GENERAL NOTES

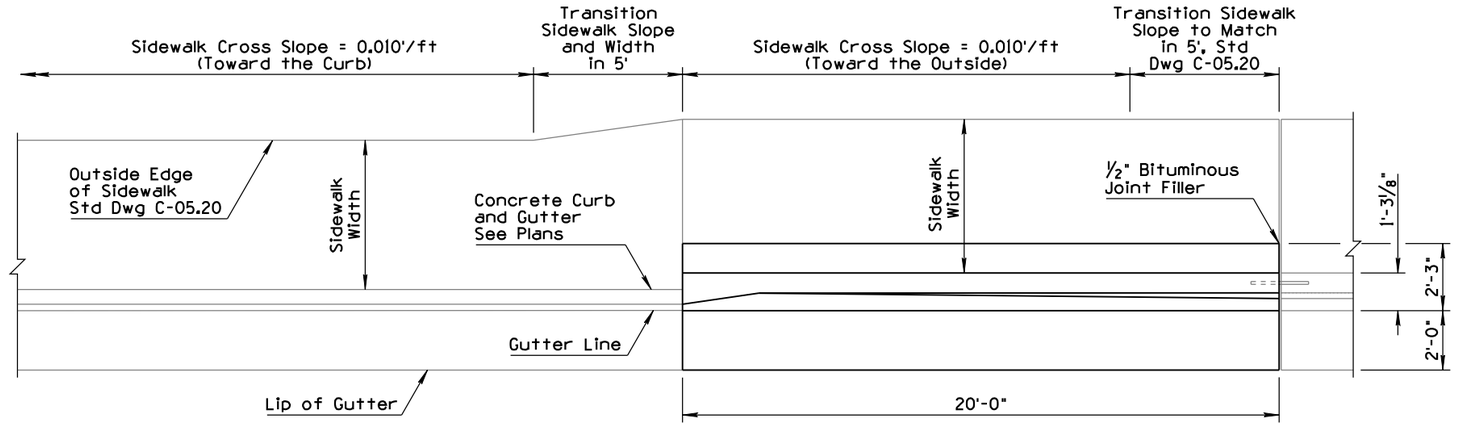
1. Half Barrier shall be constructed by the slip or fixed form method.
2. When obstacles prevent the use of slip form equipment, stationary forms shall be used.
3. Concrete shall be Class S, f'_c=4000 PSI.
4. # 4 rebar shall extend 12" past the construction joint at the completion of the day's pour.
5. (1) Gutter thickness may be adjusted to match the PCCP thickness, as approved by the Engineer.
6. When the pavement section slopes away from the gutter, the slope of the gutter shall match the pavement cross slope. Therefore, the 2" gutter depression is not applicable.
7. At bridges, the cross slope of the gutter shall transition to match the cross-slope of the bridge. Length of the transition is 15'.
8. Two-inch deep contraction joints shall be placed in the gutter at locations which match the joints in adjacent PCCP. Joints shall be hand-tooled or sawn.
9. Whenever Half Barrier is backfilled, see Std Dwg C-10.50 for weep hole details, unless otherwise specified on the plans.



SECTION A-A

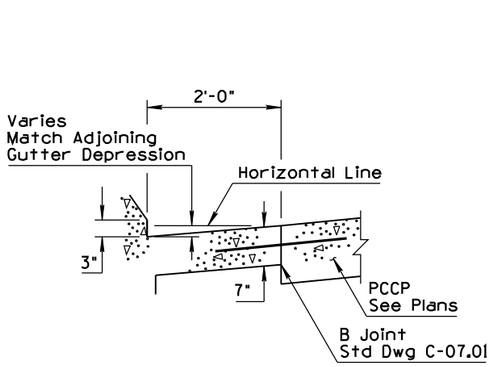
APPROVED FOR DESIGN	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS	REV.
Mary Viparina		4/06
APPROVED FOR DISTRIBUTION	CONCRETE HALF BARRIER 32" TYPE 'F' WITH GUTTER	DRAWING NO.
		C-10.52

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED SECTION VIEW GRAPHICS	RLF	4/06
2	REVISED 'H' HEIGHT DESIGNATION TO 'h'	RLF	4/06
3			
4			

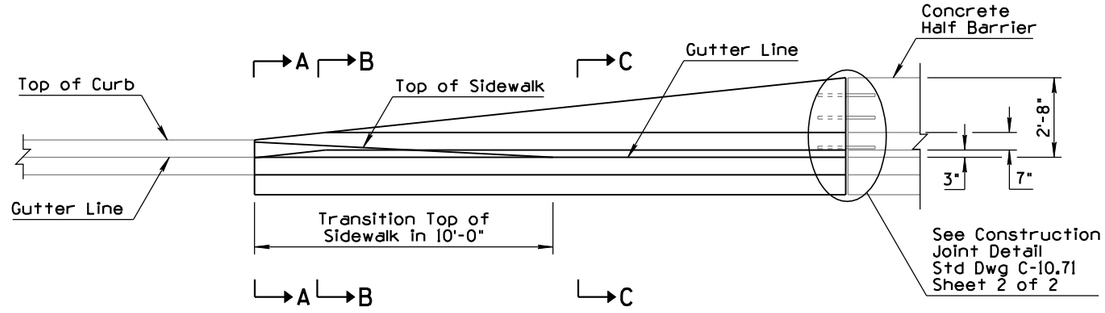


PLAN

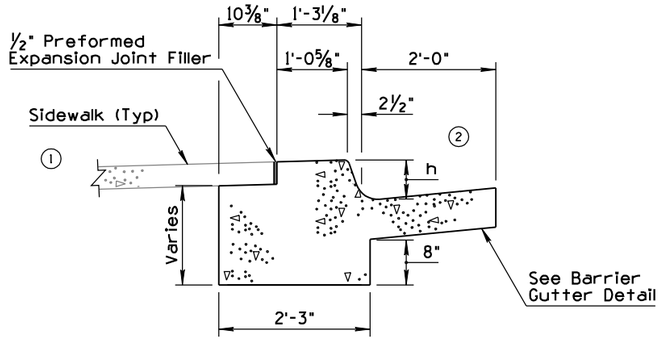
Traffic



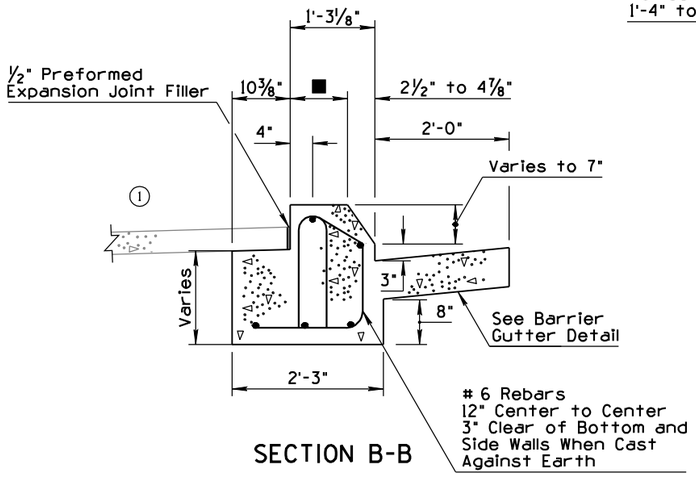
BARRIER GUTTER DETAIL



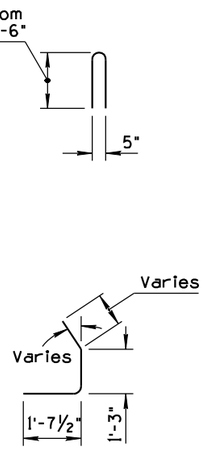
ELEVATION



SECTION A-A

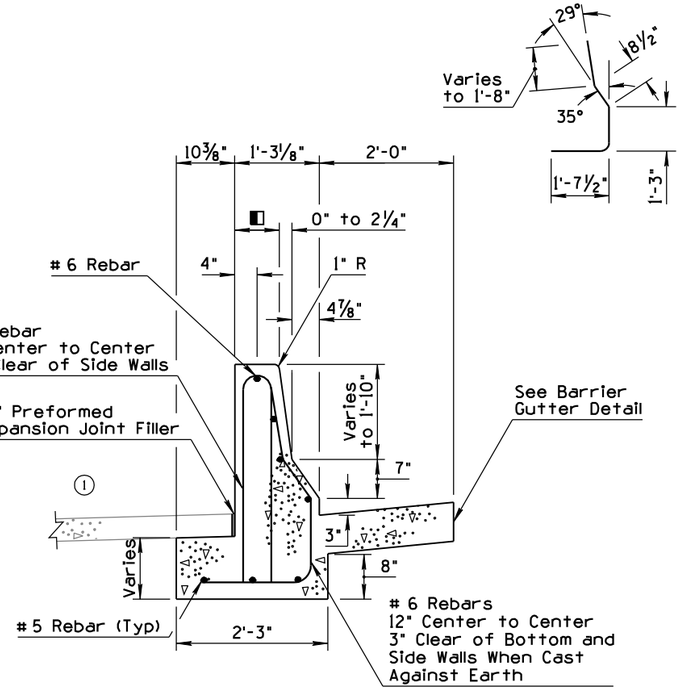


SECTION B-B



GENERAL NOTES

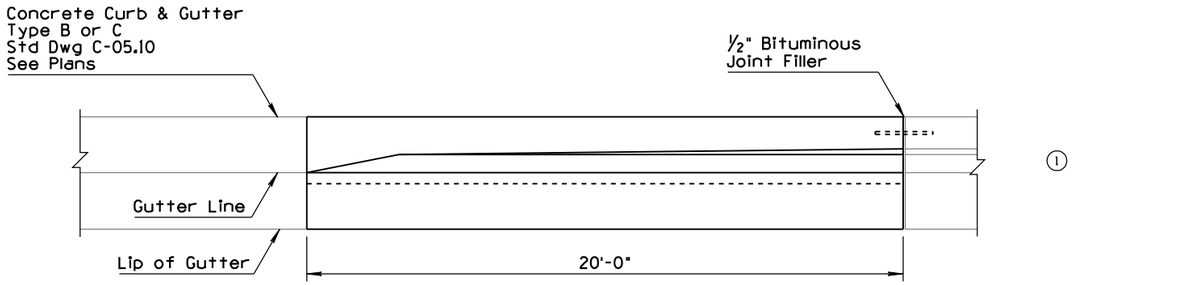
1. All concrete shall be Class S, f'c=4000 PSI.
2. All rebar shall conform to Std Spec 1003.
3. All rebar shall have 2" minimum clear cover unless otherwise noted.
4. See drainage sheets for slotted drain and catch basin details.
5. Barrier transition shall match both adjoining curb and gutter and concrete Half Barrier.
6. See Std Dwg C-05.20 for sidewalk construction.
7. All bend dimensions for rebar are out-to-out of rebars.
8. Two-inch deep contraction joints shall be placed in the gutter at locations which match the joints in adjacent PCCP and at approximate 15' centers when adjacent to AC pavement. Joints shall be either hand tooled or sawn.
   - ◧ 10¼" to 8"
   - ■ 1'-0⅝" to 10¼"



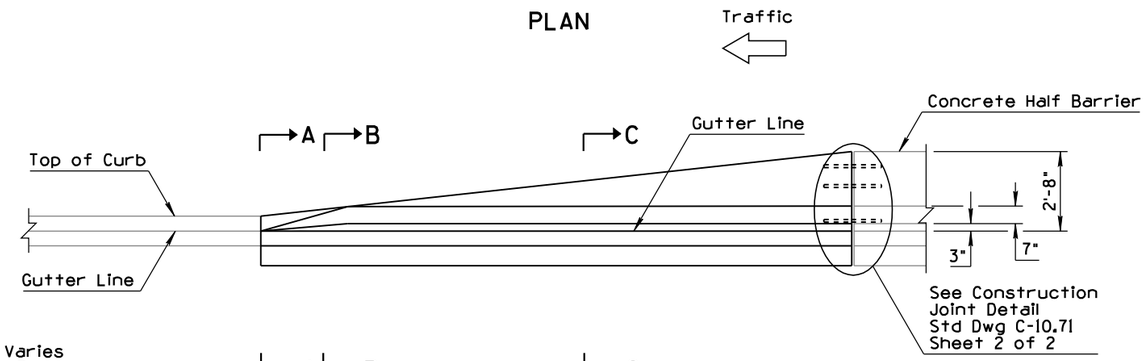
SECTION C-C
TRANSITION TO VERTICAL TYPE CURB

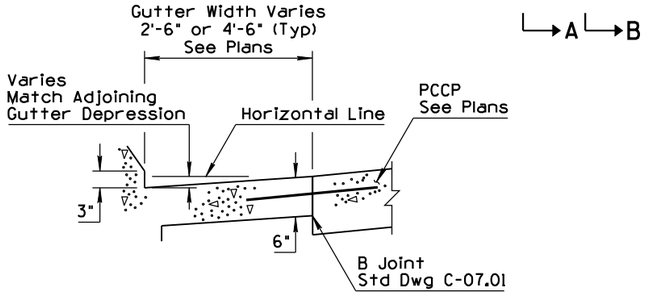
APPROVED FOR DESIGN Mary Vipraio	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS	REV. 4/06
APPROVED FOR DISTRIBUTION John Bernard	CONCRETE HALF-BARRIER TRANSITION TYPE 'F' TANGENT DEPARTURE TYPE 1	DRAWING NO. C-10.75 Sheet 1 of 2

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REMOVED DIMENSIONS	RLF	4/06
2			
3			
4			

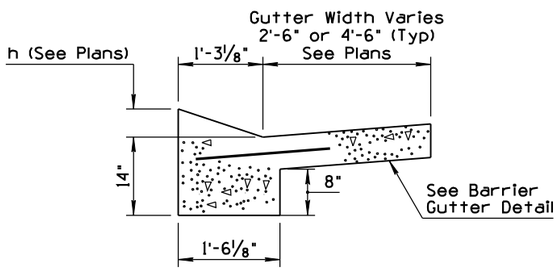


PLAN

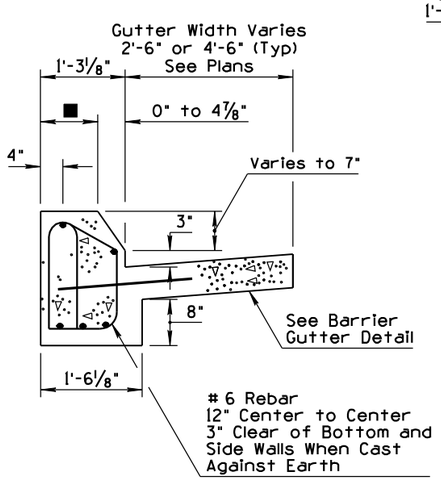




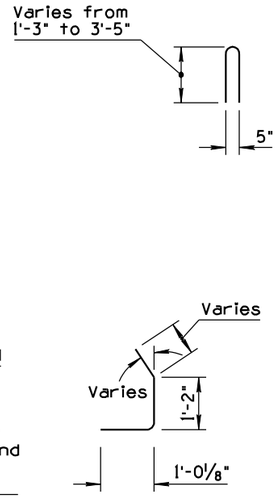
BARRIER GUTTER DETAIL



SECTION A-A



SECTION B-B



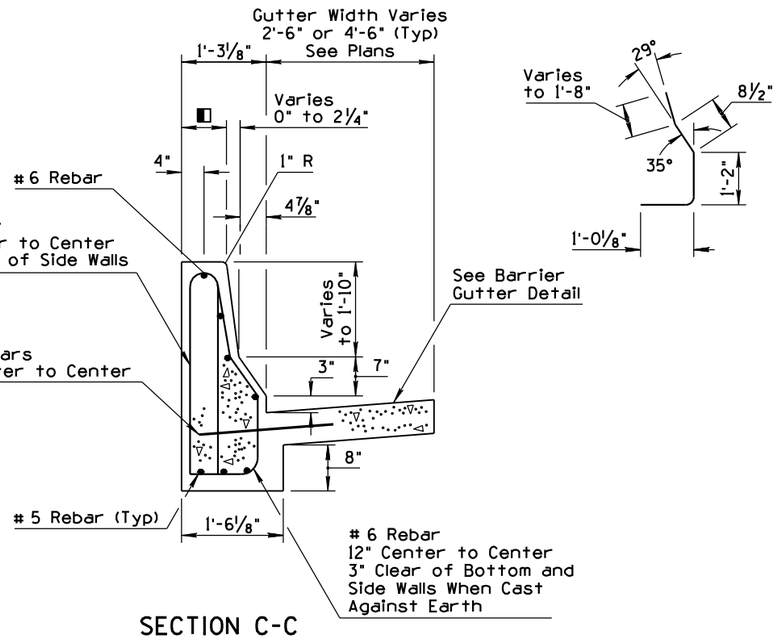
ELEVATION

GENERAL NOTES

1. All concrete shall be Class S f'c=4000 PSI.
2. All rebar shall conform to Std Spec 1003.
3. All rebar shall have 2" minimum clear cover unless otherwise noted.
4. See drainage sheets for slotted drain and catch basin details.
5. Barrier transition shall match both adjoining curb and gutter and concrete half barrier.
6. All bend dimensions for rebar are out-to-out of bars.
7. Two-inch deep contraction joints shall be placed in the gutter at locations which match the joints in adjacent PCCP and at approximate 15' centers when adjacent to AC pavement. Joints shall be either hand-tooled or sawn.

◧ Varies 10¼" to 8"

■ Varies 1'-3⅜" to 10¼"

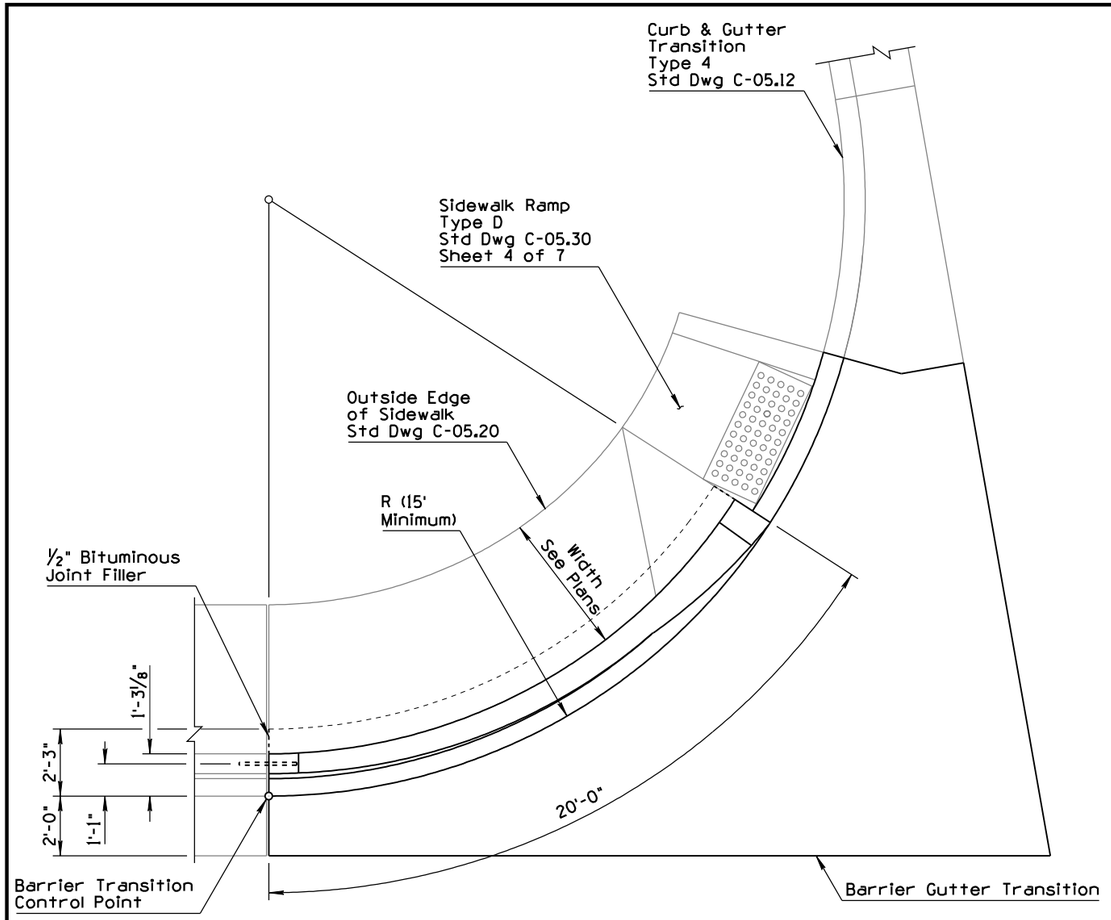


SECTION C-C

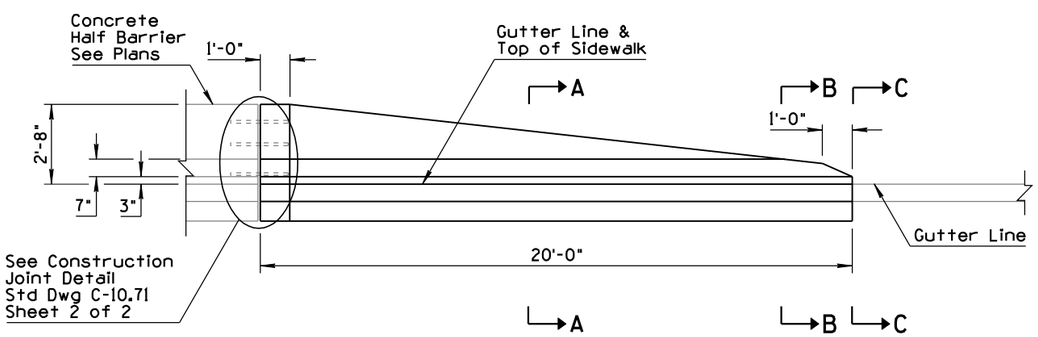
TRANSITION TO FREEWAY CURB

APPROVED FOR DESIGN Mary Viparina	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS	REV. 4/06
APPROVED FOR DISTRIBUTION John Bernard	CONCRETE HALF-BARRIER TRANSITION TYPE 'F' TANGENT DEPARTURE TYPE 2	DRAWING NO. C-10.75 Sheet 2 of 2

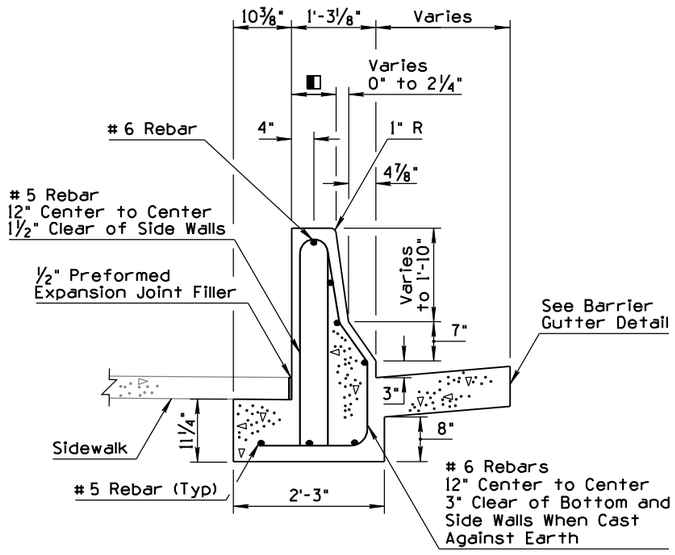
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED SECTION VIEW GRAPHICS TO SHOW TYPE 'F' BARRIER	RLF	4/06
2			
3			
4			



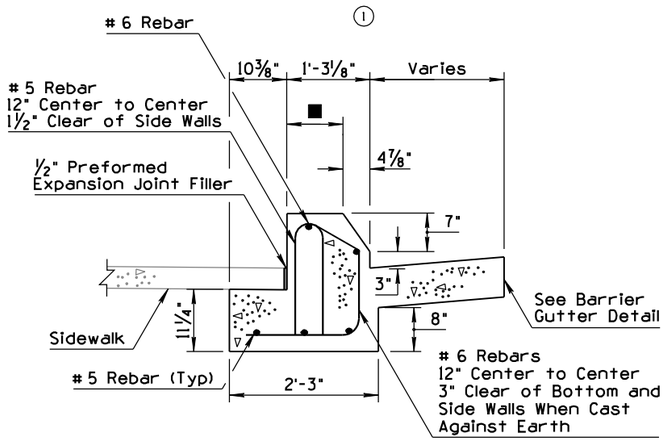
PLAN



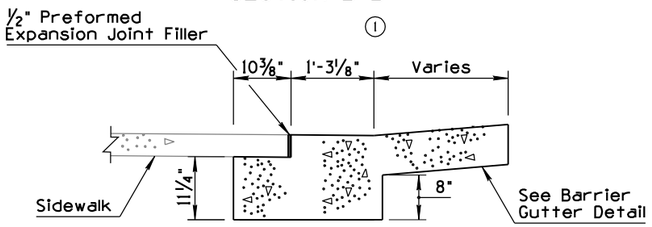
ELEVATION



SECTION A-A



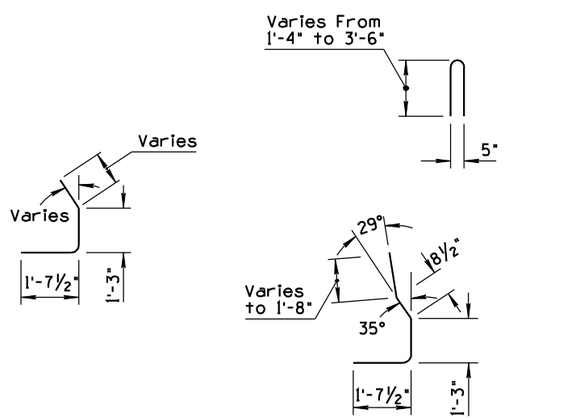
SECTION B-B

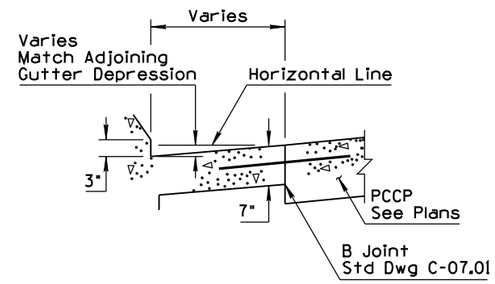


SECTION C-C ①

GENERAL NOTES

1. All concrete shall be Class S, f'c=4000 PSI.
2. All rebar shall conform to Std Spec 1003.
3. All rebar shall have 2" minimum clear cover unless otherwise noted.
4. See drainage sheets for slotted drain and catch basin details.
5. Barrier transition shall match the adjoining concrete half barrier.
6. See Std Dwg C-05.20 for sidewalk construction.
7. All bend dimensions for rebar are out-to-out of bars.
   - ◧ 10¼" to 8"
   - ■ 1'-0⅝" to 10¼"

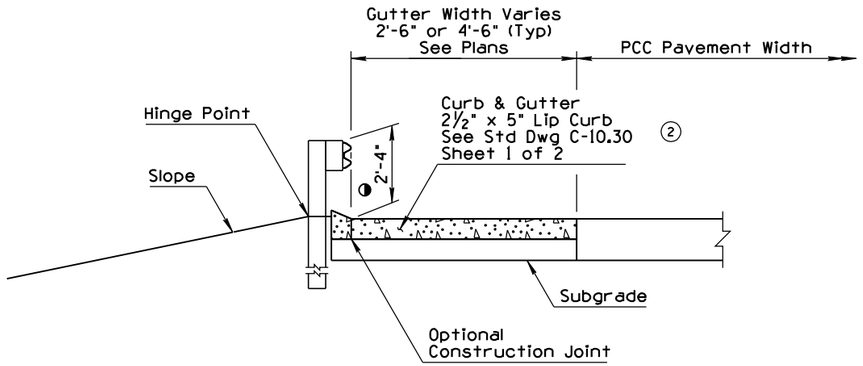




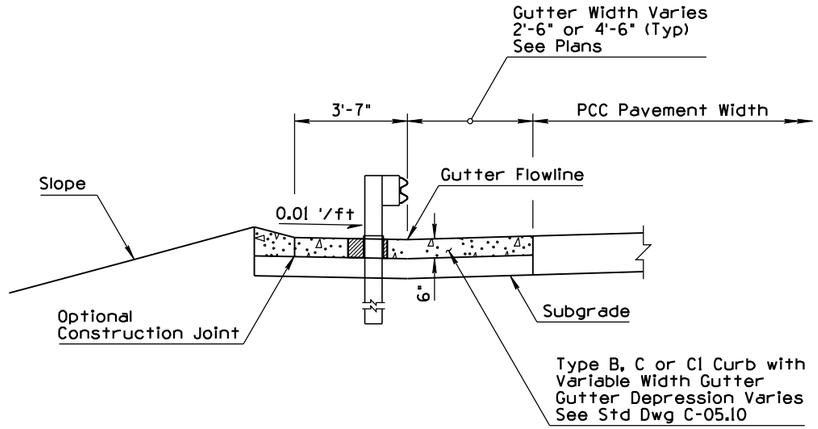
BARRIER GUTTER DETAIL

APPROVED FOR DESIGN Mary Vipaina	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS	REV. 4/06
APPROVED FOR DISTRIBUTION	CONCRETE HALF-BARRIER TRANSITION TYPE 'F' AT RADIUS 32" TO 0"	DRAWING NO. ① C-10.76

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	RENAMED STD DWG FROM C-10.06 AND REVISED TITLE	RLF	9/04
2	MODIFIED REFERENCE	RLF	4/06
3			
4			



SECTION A-A

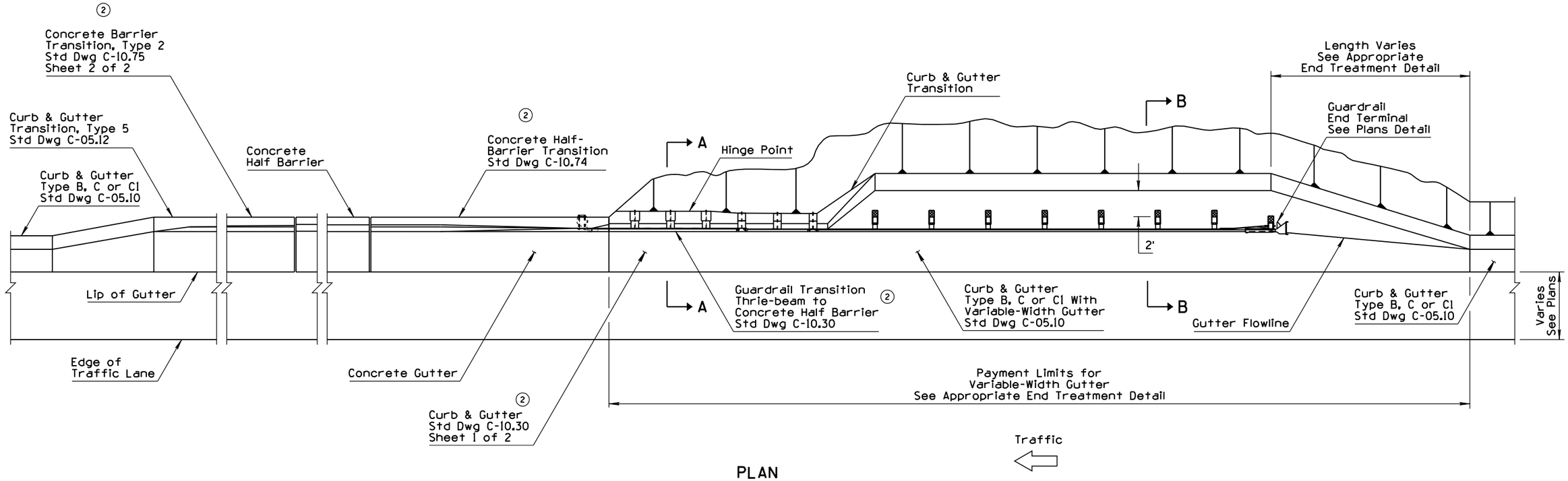


SECTION B-B

GENERAL NOTES

1. See plans and barrier summary sheets for location and type of guardrail and end treatments. Timber post installation shown.
2. See Std Dwgs C-05.10, 05.12, 10.01 and 10.02 for dimensions and details not shown.
3. Type B guardrail installation shown. For Type A guardrail installation, use Type D-1 Curb and Gutter instead of the Type D-2 Curb and Gutter shown.
4. See plans for type and location of drainage facilities.
5. Bituminous joint filler (½") shall be placed when the curb & gutter or concrete widening abuts slotted drains, catch basins, dados, barrier, etc. Scored joints, 2" in depth, shall be placed to match adjacent joints in PCCP or at 15' intervals when adjacent to AC or continuously reinforced concrete pavement.

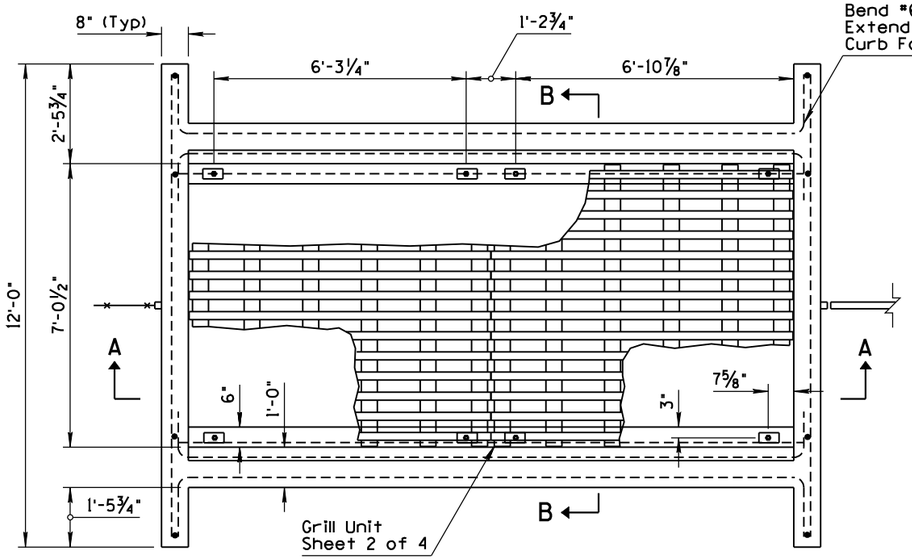
◑ To Top of W-Beam Guardrail



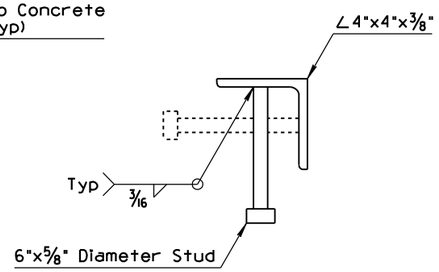
PLAN

APPROVED FOR DESIGN Mary Vipaina	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS	REV. 4/06
APPROVED FOR DISTRIBUTION John Bernard	CONCRETE HALF-BARRIER TRANSITION END TERMINAL CURB AND GUTTER ①	DRAWING NO. C-10.77 ①

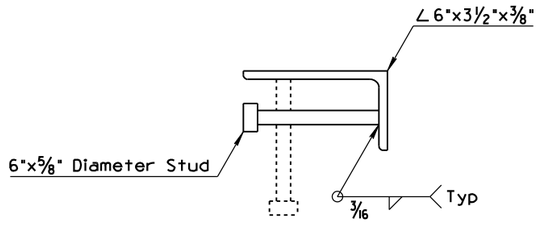
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUED STD DWG	RLF	4/06
2		RLF	4/06
3			
4			



PLAN



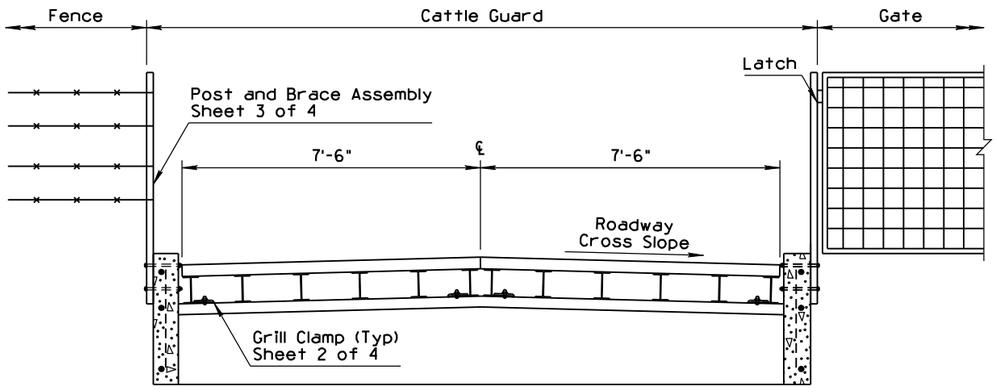
ANGLE ASSEMBLY DETAIL 1



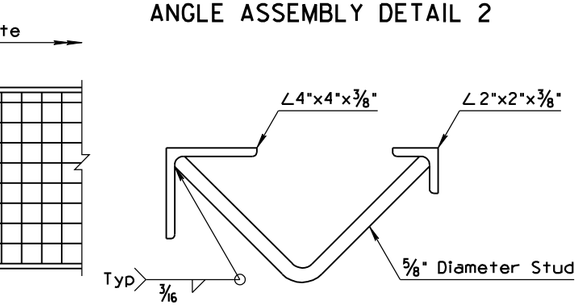
ANGLE ASSEMBLY DETAIL 2

GENERAL NOTES

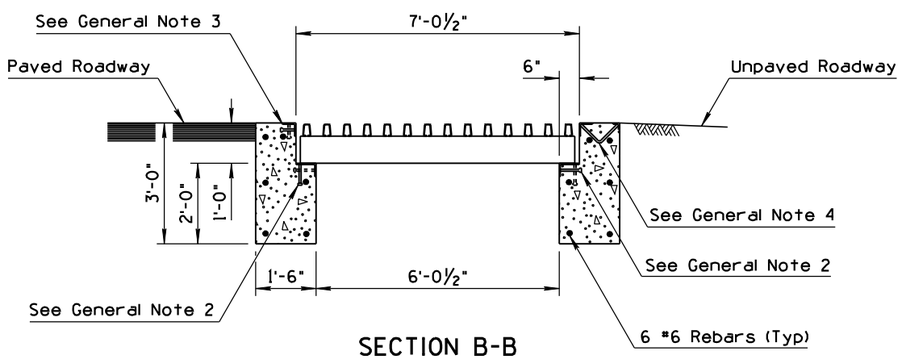
1. Cattle guard shall include two (2) clamps per Sheet 4 at each gap between two (2) grill units, one at each end. Clamps shall be adjusted to provide a ¼-inch, plus or minus 1/16-inch gap between adjacent grill units.
2. Grill units shall be set on an angle iron assembly consisting of one piece of 6"x3½"x⅜" angle iron and studs with a head. The studs shall be placed on 1'-0" alternate centers. See Angle Assembly Detail 2.
3. Cattle guard shall be sloped to conform to the roadway grade and cross-section, except that where an odd number of grill units is specified in a crowned roadway, the center grill unit shall have a level cross slope.
4. Where the adjacent roadway is paved, an angle iron assembly shall consist of one piece of 4"x4"x⅜" angle iron and studs with a head. The studs shall be placed on 1'-0" alternate centers. See Angle Assembly Detail 1.
5. Where the adjacent roadway is unpaved, an angle iron assembly shall consist of one 4"x4"x⅜" angle iron, one 2"x2"x⅜" angle iron, and connected with studs. The assembly shall be crowned at the centerline and constructed with a bevel cut and welded. The studs shall be bent 90° and placed on 1'-0" centers. See Angle Assembly Detail 3.
6. Each angle iron and angle iron assembly shall be fabricated to form a single piece for the full length of the cattle guard.
7. Quantities shown for concrete and rebar are approximations for informational purposes only.
8. When a gate is to be installed, it shall be called out on the plans.
9. All rebar shall have a minimum cover of 3", or as shown on the plans.
10. Cattle guard beams shall be HS-20 loading unless otherwise shown on the plans.



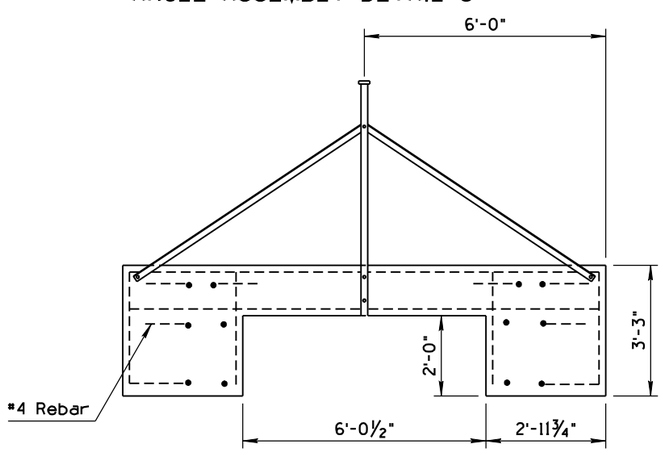
SECTION A-A



ANGLE ASSEMBLY DETAIL 3



SECTION B-B



END VIEW

UNIT TABLE

Roadway Width (ft)	Grill Units Required	Concrete (Cu Yd)	Rebar (Lbs)
12	2	5.8	175
16	3	8.0	240
20	4	10.3	310
28	5	12.5	375
34	6	14.7	445
36	6	14.7	445
38	7	16.9	510
40	7	16.9	510

APPROVED FOR DESIGN Mary Vipaina

APPROVED FOR DISTRIBUTION

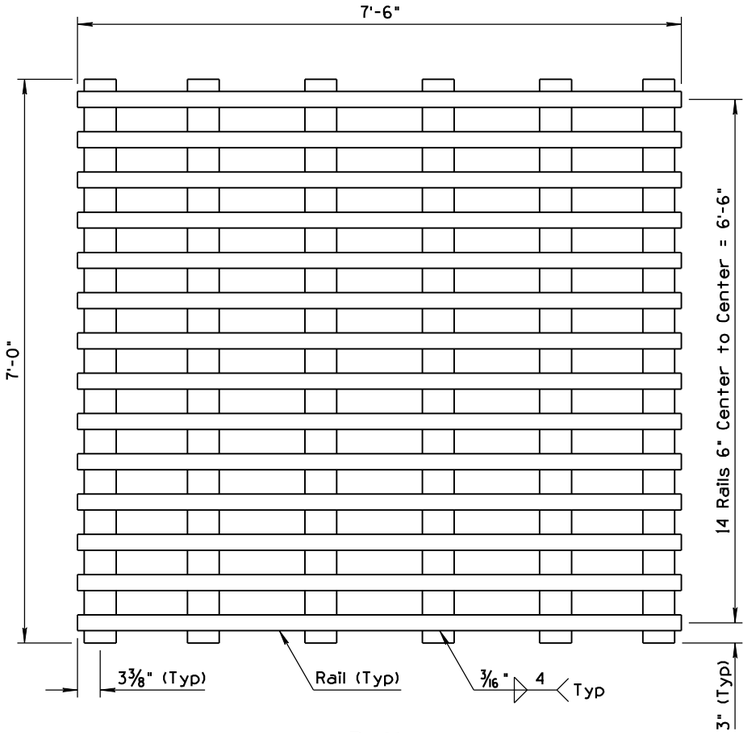
STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

REV. 4/06

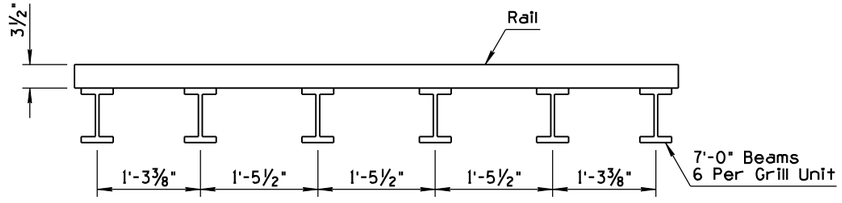
ROADWAY CATTLE GUARD

DRAWING NO. 1
C-11.10
Sheet 1 of 4

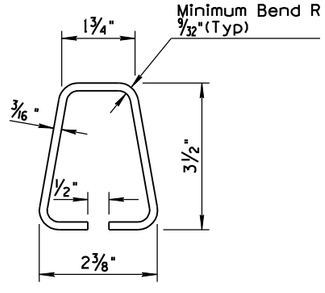
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUED STD DWG	RLF	4/06
2	MODIFIED AND MOVED WELDING SPECIFICATION	RLF	4/06
3			
4			



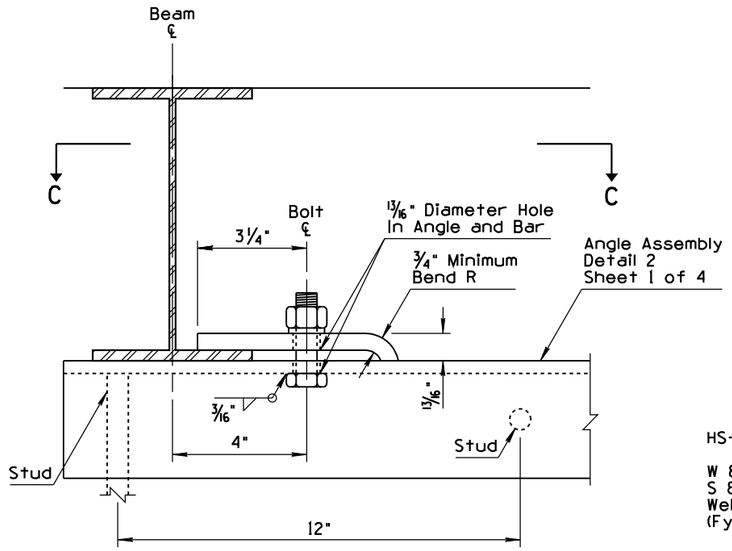
PLAN



ELEVATION



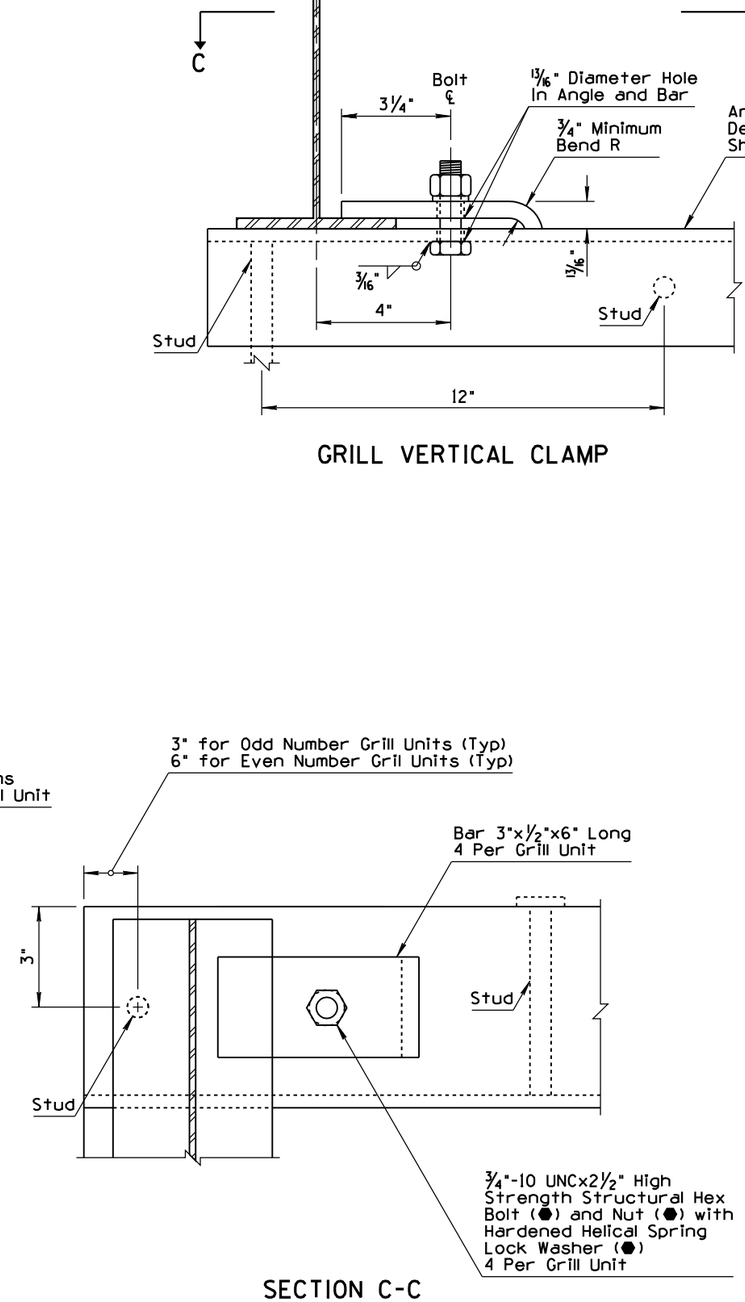
RAIL
GRILL UNIT



GRILL VERTICAL CLAMP

● - Indicates AASHTO, AGC & ARTBA Task Force 13 designation

② ◑ Full-penetration arc weld



SECTION C-C

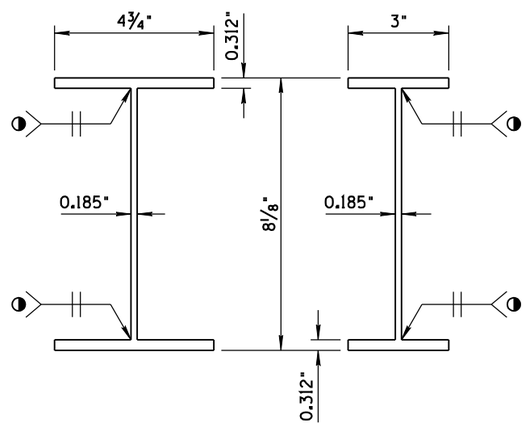
HS-20 Loading

W 8x18
S 8x18.4
Welded Beam
(Fy=42ksi)

HS-10 Loading

W 8x15

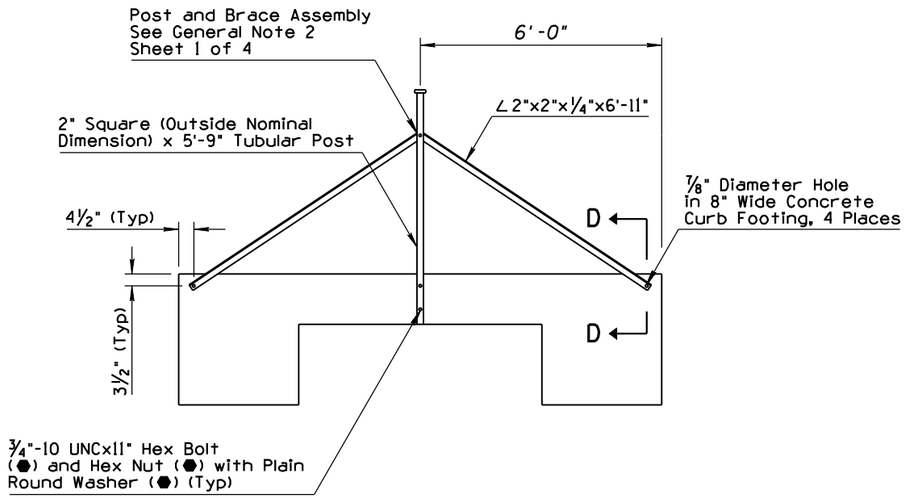
Welded Beam
(Fy=42ksi)



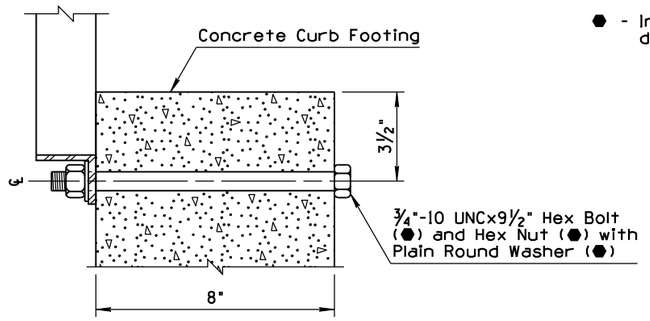
BEAMS

APPROVED FOR DESIGN Mary Vipaina	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS	REV. 4/06
APPROVED FOR DISTRIBUTION John Bernard	ROADWAY CATTLE GUARD	DRAWING NO. ① C-11.10 Sheet 2 of 4

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUED STD DWG	RLF	4/06
2			
3			
4			



END VIEW

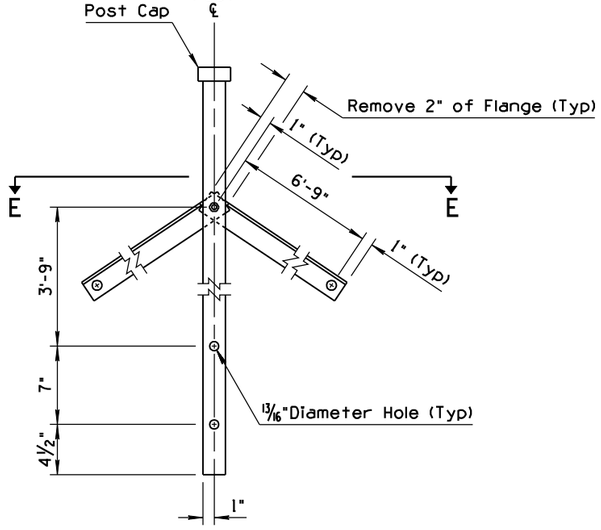


SECTION D-D

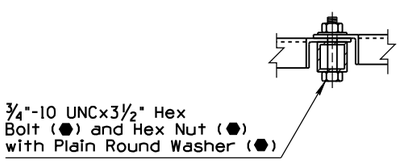
GENERAL NOTES

1. Material for shoulder transition shall be placed to the finished roadway elevation for the entire length of the transition. When the roadway is paved, aggregate subbase or AB shall be used. When the roadway is unpaved, a material equivalent to the existing roadway shall be used.
2. On steeper grades, the post shall be installed plumb to align with adjacent fencing. The brace assembly may be modified as necessary to support the post.

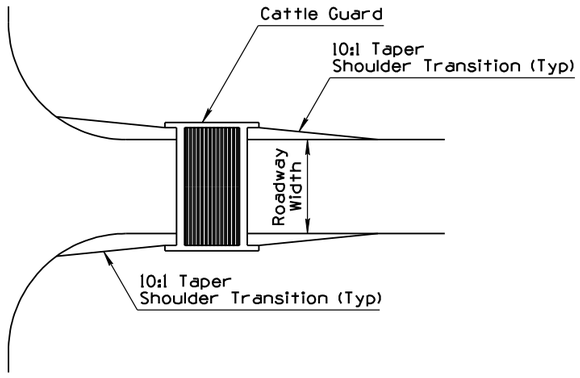
⬢ - Indicates AASHTO, AGC & ARTBA Task Force 13 designation



POST AND BRACE ASSEMBLY



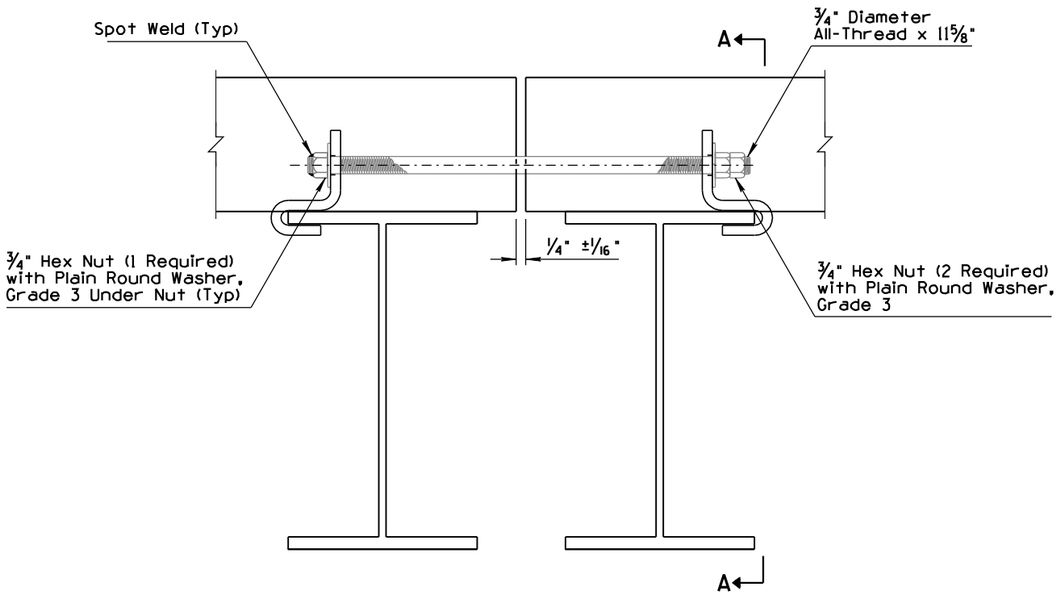
SECTION E-E



SHOULDER TRANSITION AT CATTLE GUARDS

APPROVED FOR DESIGN Mary Vipaina	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS	REV. 4/06
APPROVED FOR DISTRIBUTION	ROADWAY CATTLE GUARD	DRAWING NO. 1 C-11.10 Sheet 3 of 4

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUED STD DWG	RLF	4/06
2			
3			
4			



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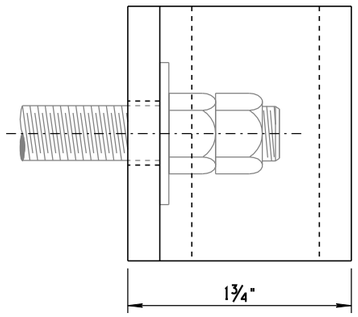
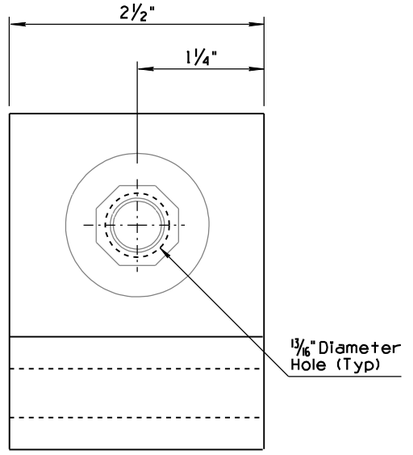
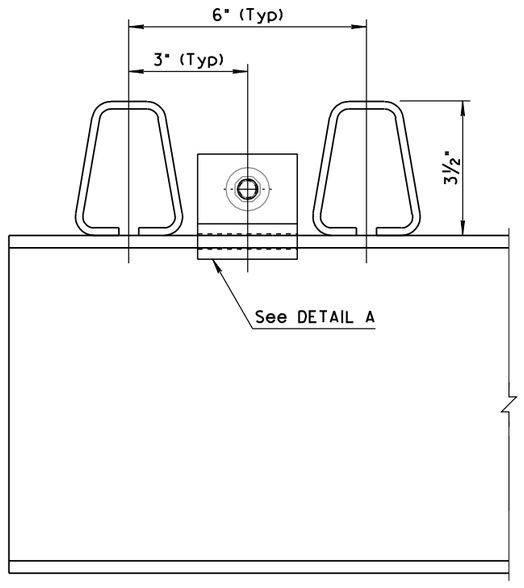


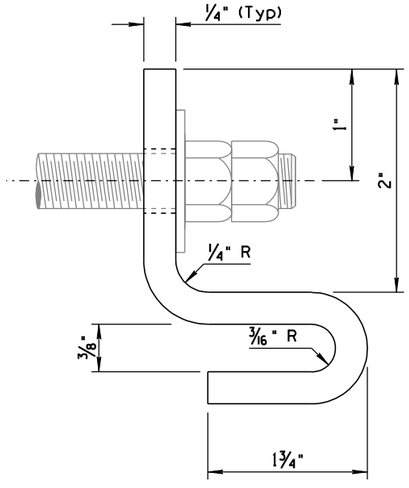
PLAN



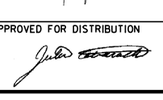
DETAIL A



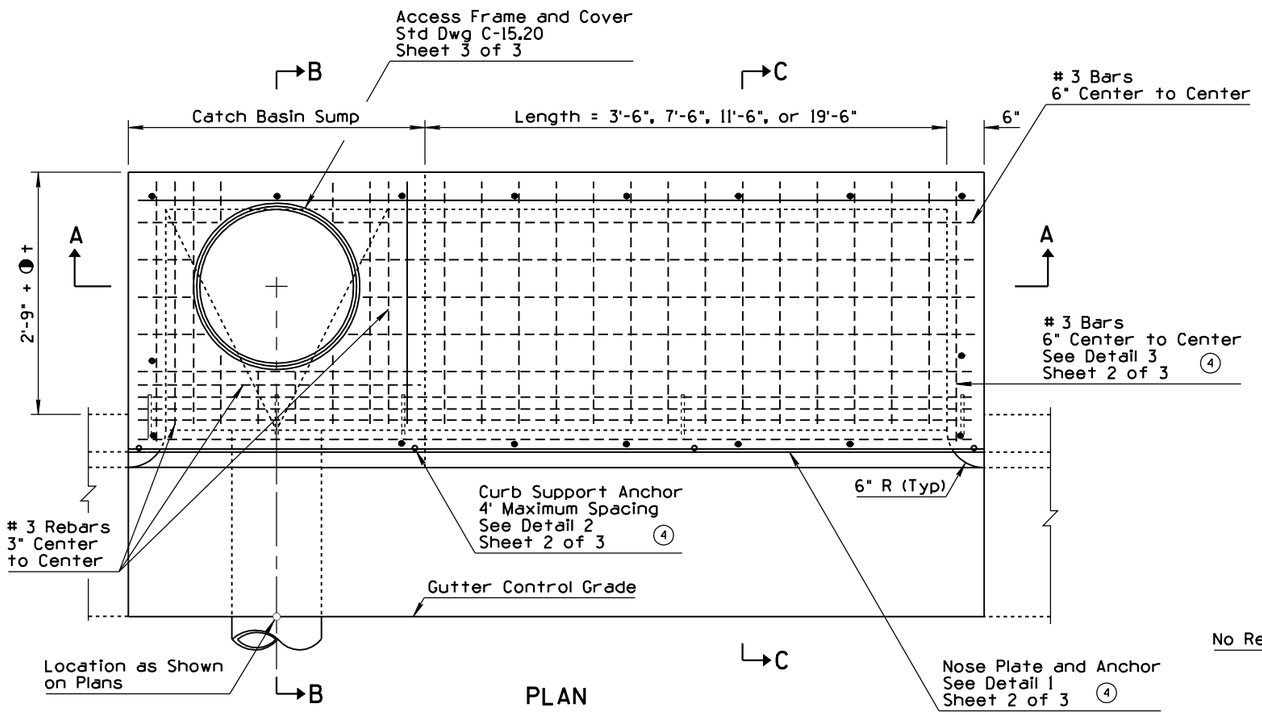
SECTION A-A



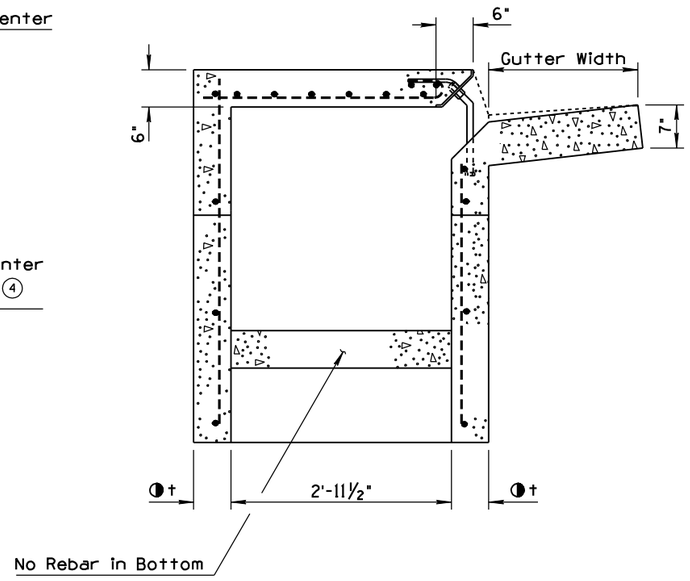
ELEVATION

APPROVED FOR DESIGN 	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS	REV. 4/06
APPROVED FOR DISTRIBUTION 	ROADWAY CATTLE GUARD GRILL HORIZONTAL CLAMP	DRAWING NO. (1) C-11.10 Sheet 4 of 4

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED NOTES 5, 10 & 11	RLF	9/04
2	DELETED GENERAL NOTE 9	RLF	9/04
3	ADDED CALLOUT	RLF	9/04
4	REVISED SHEET NUMBER REFERENCE	RLF	4/06



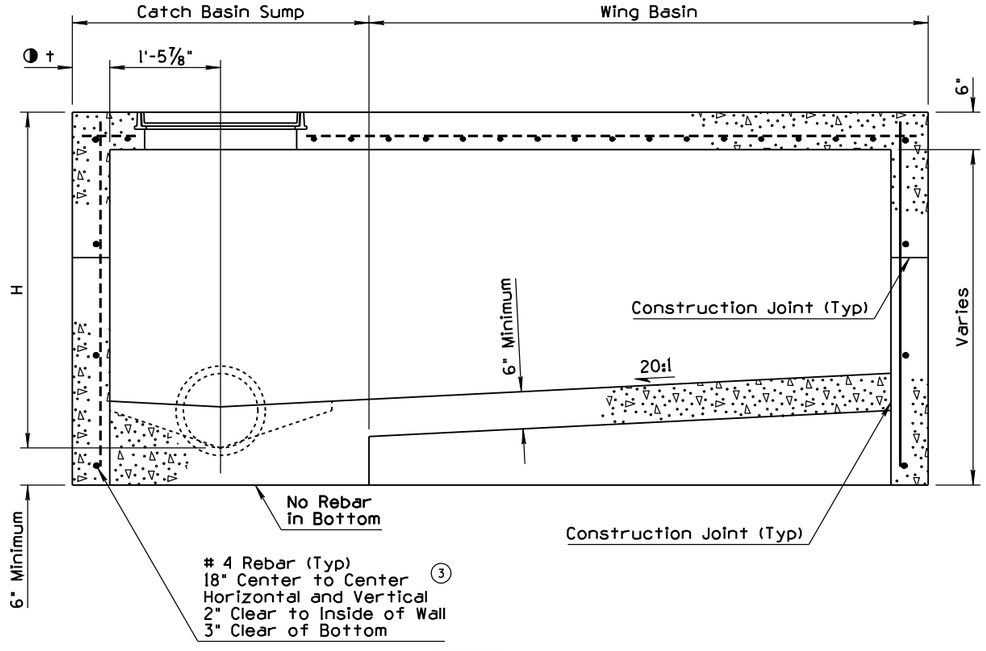
PLAN



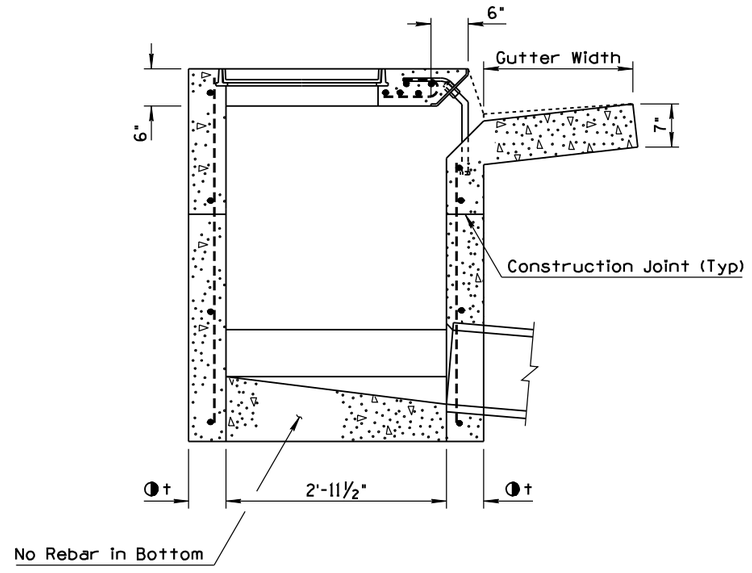
SECTION C-C

GENERAL NOTES

1. Catch basin can be used on grade or at roadway sag.
2. Catch basin has three configurations:
   Sump Only-Sump portion of catch basin (See Detail 4, Sheet 2 of 3). (4)
   Single Wing (Illustrated)-Sump with wing basin upstream.
   Double Wing-Sump with symmetrical wing basins each side.
3. Pipes can be placed in any wall except wall adjacent to wing basin.
4. Floor shall be a wood trowelled finish. Slope of the sump portion of the catch basin along the axis of the pipe shall be 4:1.
1. 5. Any specified inlet depression shall be warped to opening according to Std Dwg C-15.70.
6. All rebar shall be ASTM A36.
7. Nose plate, access frame and cover shall be given one shop coat of Number 1 paint.
8. All concrete shall be Class B.
2. 9. Curb opening area (sq ft) per inch of curb "h" + gutter depression = curb opening length (ft) x 0.0833.
1. 10. All welding shall be in accordance with Std Spec 604-3.06.
1. 11. Construction joints and drains shall be placed to meet field conditions. See Std Dwg C-15.70.
12. ◑t = 6" when H is 8' or less.
    8" when H is greater than 8'.



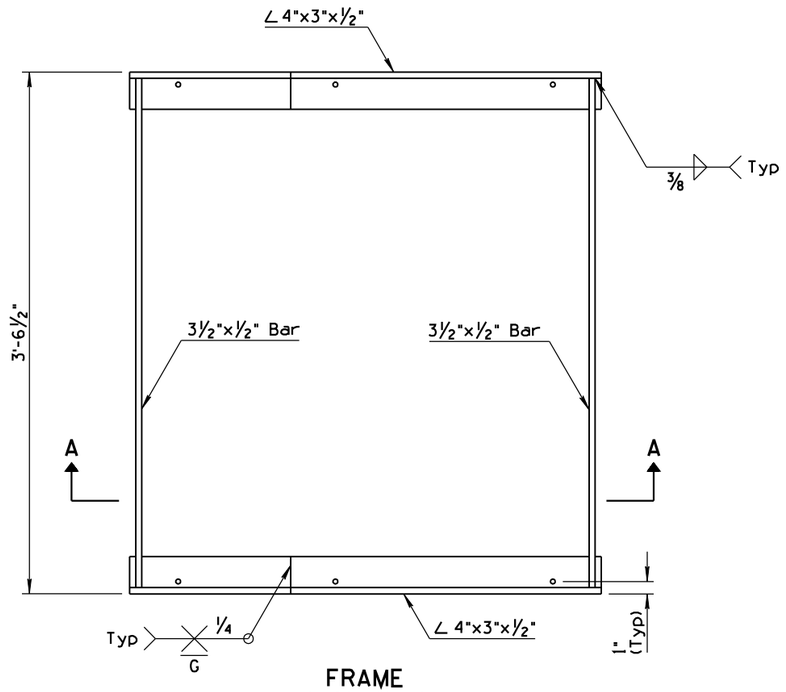
SECTION A-A
USE THIS SECTION WHEN H=5' OR LESS



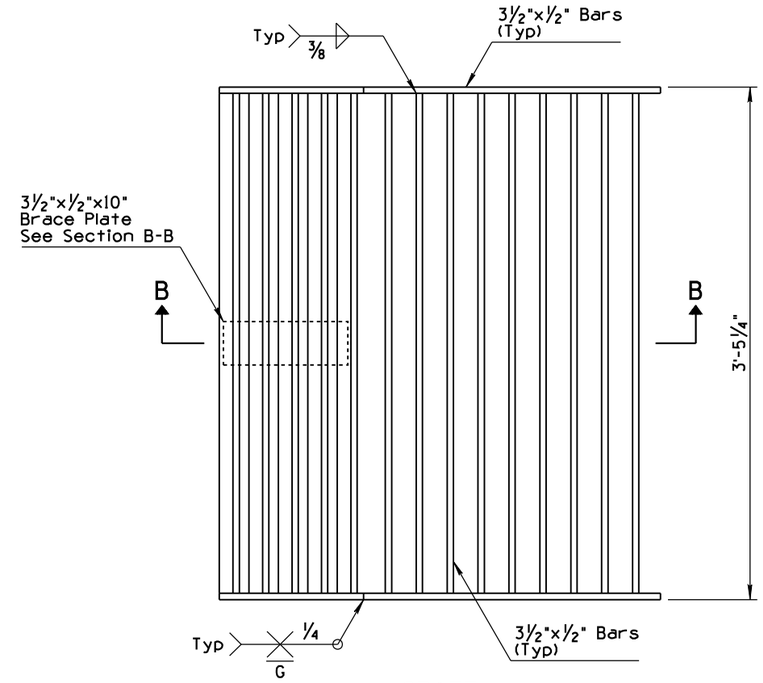
SECTION B-B

APPROVED FOR DESIGN	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS	REV.
		4/06
APPROVED FOR DISTRIBUTION	CATCH BASIN TYPE 3	DRAWING NO. C-15.20 Sheet 1 of 3

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED CONCRETE ANCHOR STUD LENGTH	RLF	9/04
2	REARRANGED GENERAL NOTES	RLF	9/04
3	REVISED WELD SIZE NOTATIONS ON DRAWING	RLF	4/06
4			



FRAME
PLAN VIEW



GRATE
PLAN VIEW

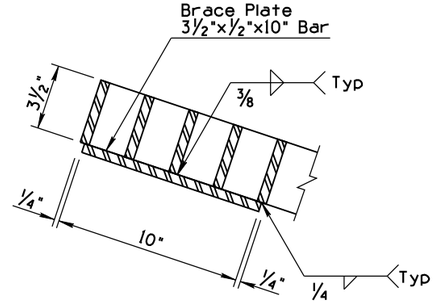
② GENERAL NOTES

1. All structural steel shall be in accordance with ASTM A36.
2. All welding shall be in accordance with Std Spec 604-3.06.
3. The completed grate assembly (frame & grate) shall be given two shop coats of Number 1 paint.

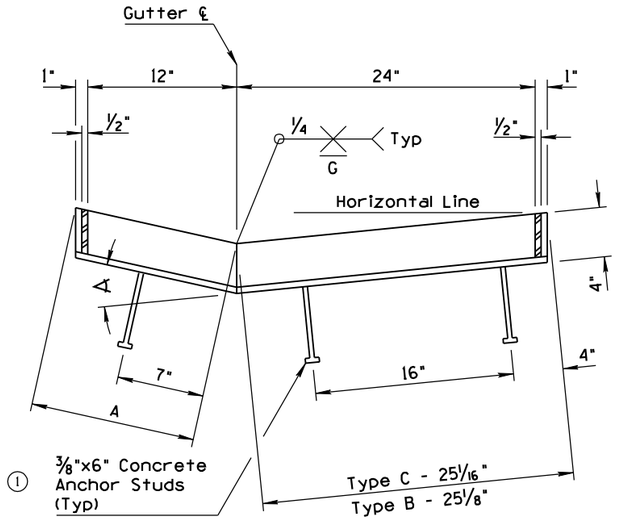
NOTE TO DESIGNERS

Grate design is not suitable for locations subject to bicycle traffic.

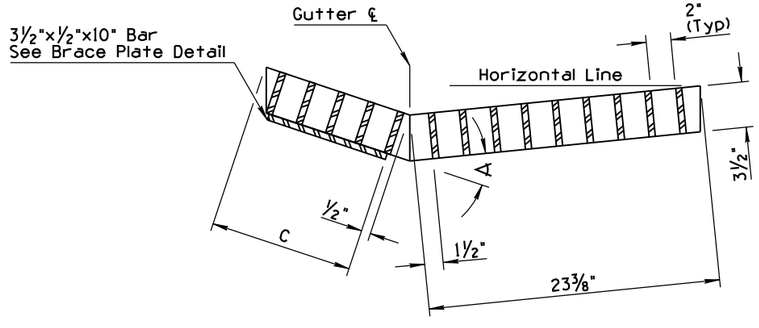
GRATE AND FRAME DIMENSIONS						
Type	Curb Height (In)	Gutter Width (Ft-In)	Catch Basin Frame		Catch Basin Grate	
			A (In)	∢	C (In)	∢
B	6	2-6	13 15/16	26°-57'-40"	12 1/16	26°-57'-40"
C	3	2-6	13 5/16	15°-37'-45"	11 7/8	15°-37'-45"



BRACE PLATE DETAIL



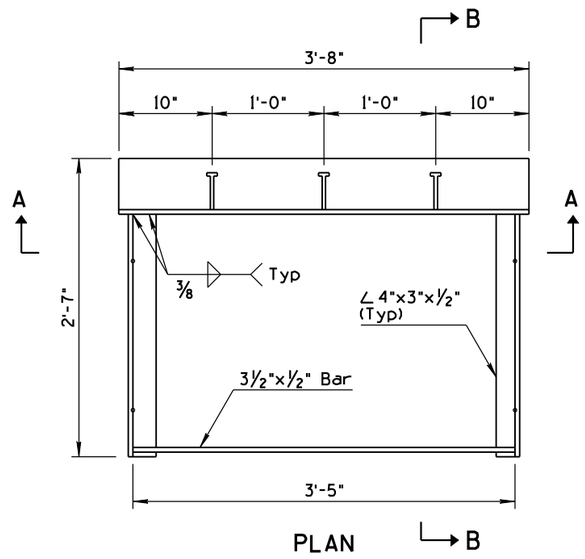
SECTION A-A



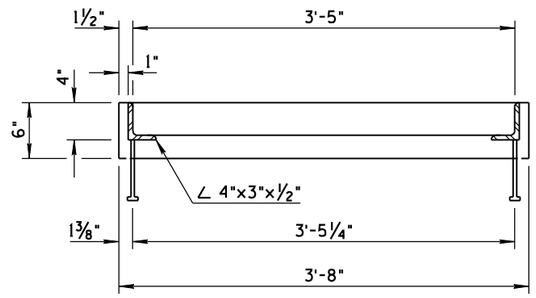
SECTION B-B

APPROVED FOR DESIGN	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS	REV.
Mary Vipaina		4/06
APPROVED FOR DISTRIBUTION	FREEWAY CATCH BASIN DETAILS	DRAWING NO. C-15.91 Sheet 2 of 2

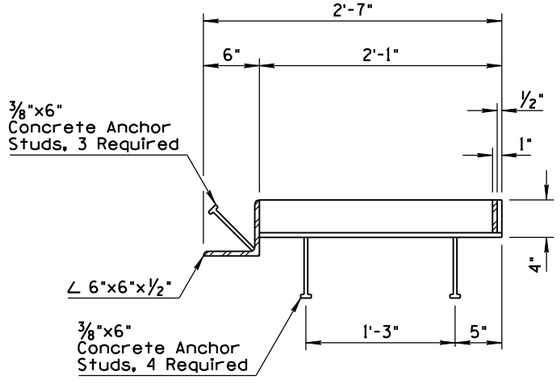
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUED STANDARD DRAWING	RLF	9/04
2	DELETED GENERAL NOTE	RLF	4/06
3	REVISED WELD SIZE NOTATIONS ON DRAWING	RLF	4/06
4			



PLAN

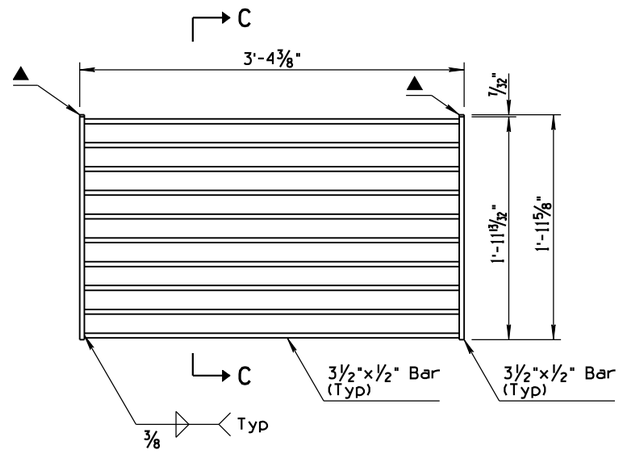


SECTION A-A

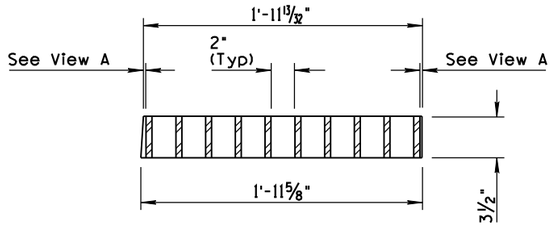


SECTION B-B

FRAME

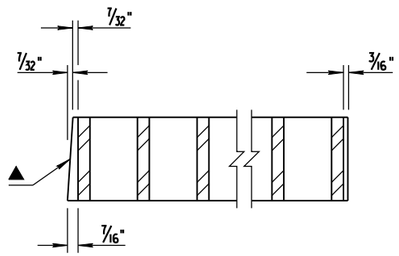


PLAN



SECTION C-C

GRATE



View A

GENERAL NOTES

1. All welding shall be in accordance with Std Spec 604-3.06.
2. Grate opening for grate shown is 4.75 Sq Ft.

(2)

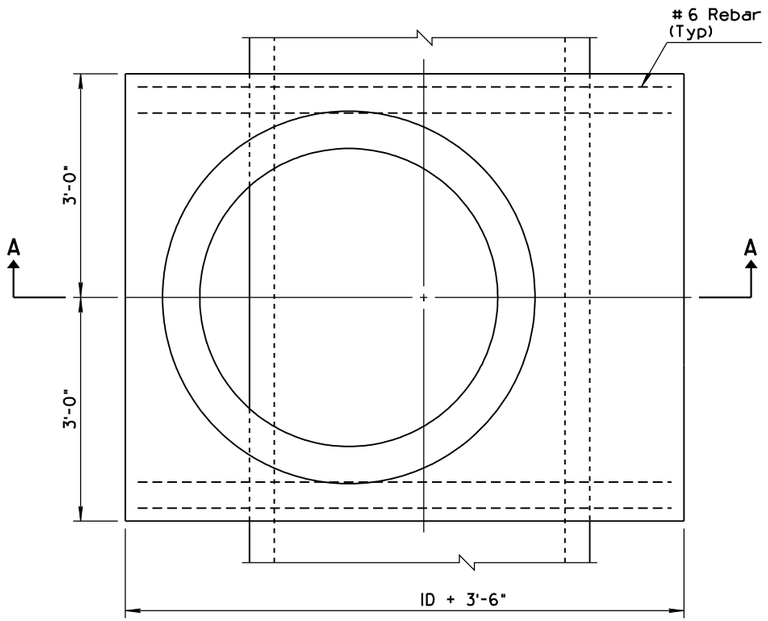
▲ Beveled side of grate toward barrier

NOTE TO DESIGNERS

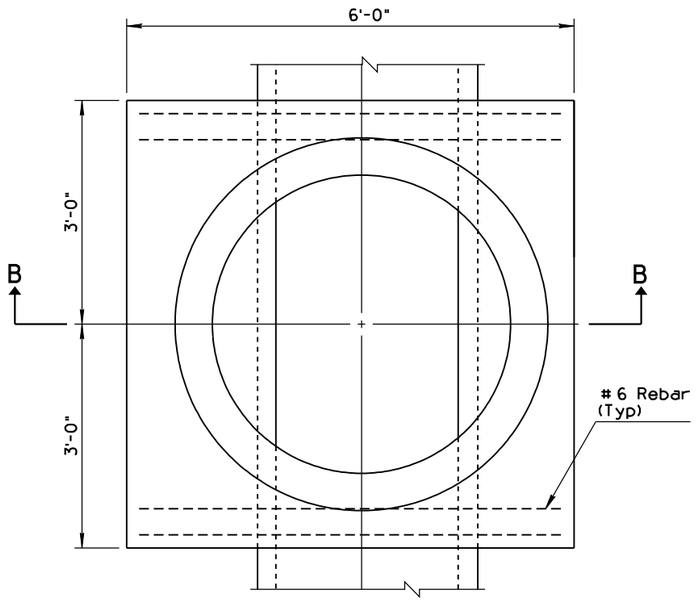
Grate design shown is not suitable for locations subject to bicycle traffic. Use Std Dwg C-15.50 grate with Std Dwg C-15.92 frame (Sheet 2 of 2) for locations with bicycle traffic.

APPROVED FOR DESIGN Mary Vipaina	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS	REV. 4/06
APPROVED FOR DISTRIBUTION	CATCH BASIN WITH TYPE 'F' CONCRETE HALF BARRIER	DRAWING NO. (1) C-15.92 Sheet 2 of 2

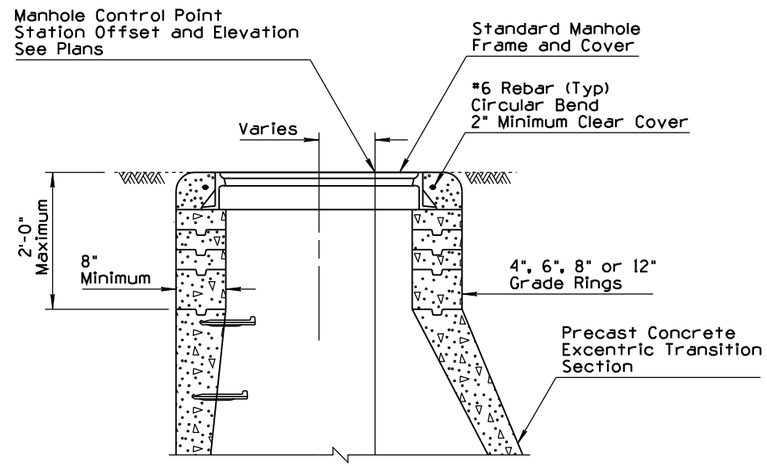
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	RENAMED STD DWG TO C-18.10, SHEET 2 OF 3	RLF	9/04
2	REVISED SECTION A-A THROUGH C-C GRAPHICS	RLF	4/06
3			
4			



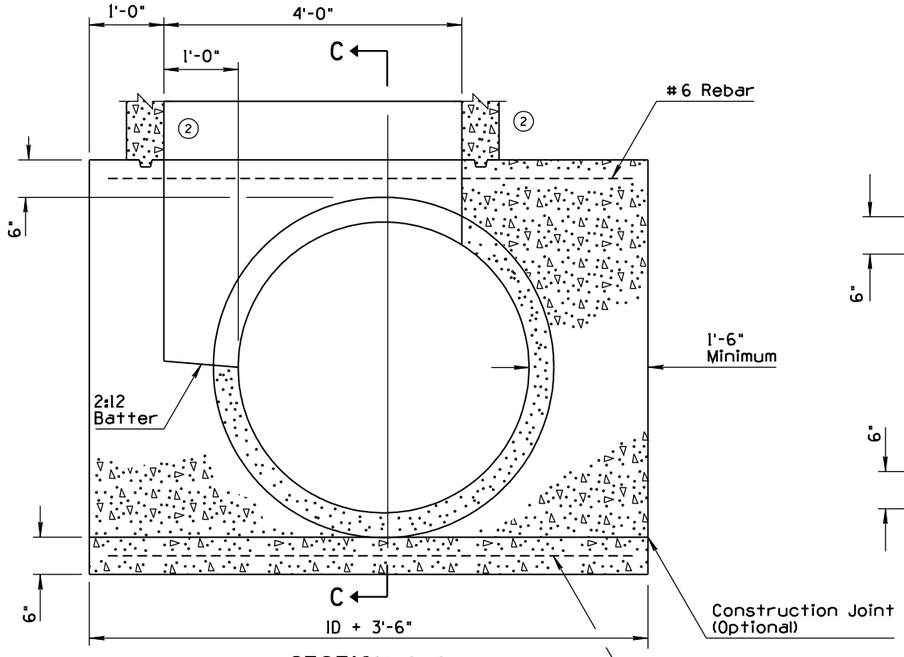
PLAN
FOR PIPES OVER 36" ID



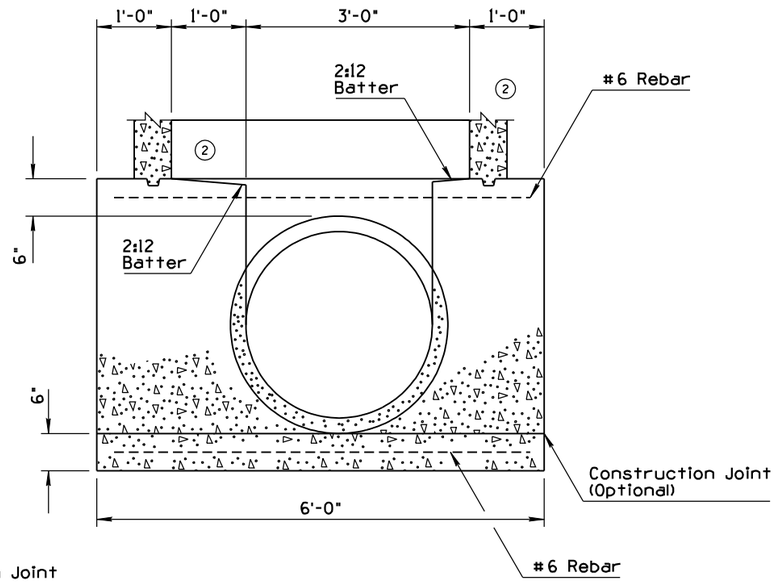
PLAN
FOR PIPES 36" ID AND SMALLER



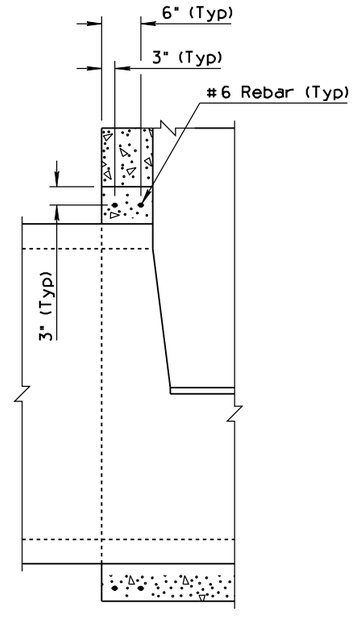
SECTION
RING, FRAME & COVER
NON-PAVEMENT INSTALLATION



SECTION A-A
STANDARD BASE STRUCTURE
FOR PIPES OVER 36" ID



SECTION B-B
STANDARD BASE STRUCTURE
FOR PIPES 24" TO 36" ID



② SECTION C-C

APPROVED FOR DESIGN Mary Viparina	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS	REV. 4/06
APPROVED FOR DISTRIBUTION John Bernard	MANHOLE BASE DETAILS NORMAL INSTALLATION	DRAWING NO. ① C-18.10 Sheet 2 of 3